Products finishing

HOWARD CAMPBELL, Editorial Director
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CONTENTS

International Convention, American Electro-Platers' Society 9

Use of Conveyors Expedites Production in Plating Department 16
By E. W. Cochran

Barrel Finishing of Metal Products 26
By H. Leroy Beaver

Thought-Provoking Problems in the Finishing Industry 42
By Frederick Fulforth

Metals Exhibit at the New York World's Fair 48

Heat Lamp Reflectors Gold Plated at Ford Plant 50

News of the Industry 52

Finishes That Aid in Appearance and Utility 54

New Plant Equipment and Materials 56

Opportunity Section 69

For Your Catalog Library 70

Index to Advertisements 72

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PRODUCTS finishing

CINCINNATI, OHIO VOL. 3, NO. 9

JUNE, 1939

International Convention, American Electro-Platers' Society

IT IS expected that one of the largest groups of electroplaters ever gathered together in one place will meet at the Berkeley-Carteret Hotel, Asbury Park, N. J., June 19 to 22, to attend the International Convention of the American Electro-Platers' Society.

More than a score of vitally important papers, prepared by experienced platers and dealing with various phases of the electroplating art, are to be presented. Among these papers will be several that have been prepared by platers from Canada, England, and France, thus affording those who attend the Convention an opportunity to receive firsthand information regarding the plating procedures and methods employed, not only in this country, but also abroad.

Three distinct awards will be given for outstanding papers. The first of these is the Founder's Gold Medal, to be given only to an active member of the Society who, in the opinion of the committee, presents the best paper on electroplating or allied subjects. The second is the A.E.S. Gold Medal which is given to any member of the Society, active or associate, whose paper is considered best.

The third award presented is the Proctor Memorial Award, presented by the founder of the Society in memory of his deceased wife, Mrs. Herminie Dorothea Proctor. The third award consists of $100.00 and is open to all who wish to compete. The decision of the committee in all cases is considered final.

In making their decisions, the members of the committee base their selection of the best papers on the following factors: One, originality of thought; two, amount of work involved; three, value to electroplating; four, quality and accuracy of work and presentation.

In addition to the reading of the papers, there will be discussions on the outstanding developments in the finishing field during the past year.

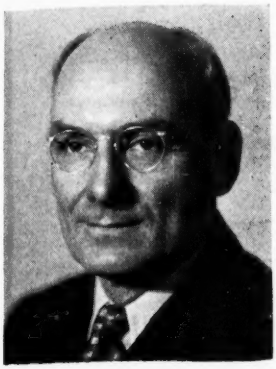
One of the attractions of this year's Convention will be the plated ware exhibit. According to the latest reports, released by the committee in charge of exhibits, the exhibit will include plated products representing the automotive, refrigerator, plumbing, hardware, optical goods, furniture, lighting fixture, jewelry, radio, and other industries. The committee assures everyone that every minute of time spent at the Convention will be worthwhile. According to the plan followed in previous years, all exhibits will be entered in competition for prizes, and awards will be made for the best display by the chairman of awards. A complete explanation of the plating procedure required to finish each item will accompany each exhibit.

An unusually well-rounded-out program for the ladies is planned to make enjoyable their visit to Asbury Park. Activities in which all may participate such as ocean bathing, theater parties, luncheons, and so on, are included in the program.

Registration is the only requirement for admission to the meetings of the Convention for anyone engaged in metal finishing. Membership in the American Electro-Platers' Society is not a primary requisite in order to be assured of a sincere and cordial welcome.

Every plating executive who attends the International Convention at Asbury Park will benefit by making himself better informed on modern plating practice and thus a more valuable asset to his company.

Officers of American Electro-Platers' Society



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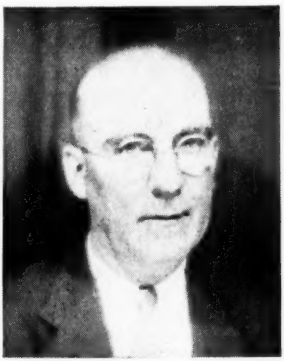

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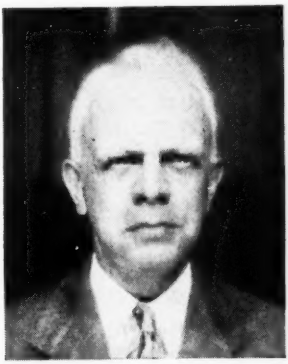


"Educational Program For 1939 Convention"

Arranged by Educational Committee, George B. Hogaboom, Chairman

Sessions start promptly on time!

First Session — Monday Afternoon, June 19th—1:30 P. M.

Charles H. Proctor, Presiding
Founder, American Electroplaters' Society

1. "Notes on Adhesion of Electroplated Coatings." A. W. Hothersall, M.Sc., Woolwich, London, England.
2. "Distribution of Deposits on Cup-Shaped Cathodes." G. F. Gardam, B.Sc., A.R.C.Sc.
3. "Recent Developments in British Plating Practice." C. F. Francis-Clark, Ch.E.
4. "Chemical Methods for Testing Thickness of Metallic Coating." S. G. Clark, Ph.D.

The above papers are contributions from The Electro Depositors' Technical Society, London, England.

5. "Review of Electroplating Methods in France." M. Ballay, Ph.D., Consulting Engineer, Paris, France.

Second Session — Tuesday Morning, June 20th—9:00 A. M.

John Acheson, President
President, Toronto Branch

1. "The Role of Diffusion in Electroplating Process." Dr. J. T. Burt-Gerraus, Toronto University, Toronto, Canada.
2. "Theoretical Training for Electroplating Industry." Dr. J. U. MacEwan Birks, Professor of Metallurgy, McGill University, Montreal, Canada.
3. "Electrodeposition of Black Molybdenum Finishes." R. O. Hull, Cleveland Branch, The Grasselli Chemical Co., Cleveland, Ohio.
4. "The Ampere Hour Meter." Burton G. Daw, St. Louis Branch President, Lasalco, Inc., St. Louis, Mo.

Third Session — Tuesday Afternoon, June 20th—1:30 P. M.

Charles C. Conley, Presiding
President, Dayton Branch

1. "Chromium Plating Dies and Gages." Dr. D. A. Cotton, Anderson Branch, Director Research, Delco Remy Division, General Motors Corp., Anderson, Indiana.
2. "Anodic Coatings of Aluminum." Dr. Junius D. Edwards, Assistant Director of Research, Aluminum Co. of America, New Kensington, Pa.
3. "The Application of X-ray Diffraction to Electroplating Prob-

lems." Herbert R. Isenberger, St. John X-ray Service, Inc., Long Island City, N. Y.

4. "Bright Dipping and Electrolytic Brightening of Aluminum, Copper, Iron, Lead and Zinc and Their Alloys." Dr. Walter R. Meyer, Bridgeport Branch, Editor Metal Industry, New York, N. Y.

Fourth Session — Tuesday Evening, June 20th—7:30 P. M.

Joseph Underwood, Presiding
President, Philadelphia Branch

1. "A Study of Electrolyte Films." Dr. A. Kenneth Graham, Philadelphia Branch. Consulting Engineer, A. Kenneth Graham & Associates, Jenkinstown, Pa. Harold J. Read, Instructor Electrochemistry, University of Pennsylvania, Philadelphia, Pa.
2. "The Story of Steel for Electroplating." Frederick Fulforth, Philadelphia Branch. The Proctor Electric Co., Philadelphia, Pennsylvania.
3. "The Modern Generator and Rectifier." Guerin Todd, Chief Engineer, Hanson-Van Winkle-Munning Co., Matawan, N. J.
4. "Time Pieces—From Sun Dial to Wrist Watches." L. A. Critchfield, Philadelphia Branch. Hamilton Watch Co., Lancaster, Pa. This will be of interest to the ladies. The Hamilton Watch Co. are loaning their collection of Time Pieces for this paper.

Fifth Session — Wednesday Evening, June 21st—7:30 P. M.

James W. Hanlon, Presiding
President, Chicago Branch

1. "Addition Agents in Electroplating Processes." Dr. Frank C. Mathers, Professor Electrochemistry, University of Indiana, Bloomington, Indiana.
2. "A Review of Finishing Methods." Mr. Gustav Klinkenstein, Newark Branch. Vice-President and Technical Director, Maas and Waldstein Co., Newark, N. J.
3. "Agitation." Donald Wood, Boston Branch. Reed and Barton, Taunton, Mass.
4. "Adhesion of Electrodeposits." Frank C. Mesle, Oneida Limited, Oneida, N. Y.

Sixth Session — Thursday Morning, June 22nd—9:30 A. M.

Ralph J. Liguori, President
President, New York Branch

1. "The Effect of Certain Wetting Agents Upon Nickel Deposit." C. B. F. Young, Ph.D., New York Branch.
2. "Practical Suggestions for Efficient Plating Room Lay-out." D. R. Hartshorn, Jr., Springfield Branch. Chemist, Westinghouse Elec. & Mfg. Co., Springfield, Mass.
3. "Summary of Researches on Electrodeposition at the National Bureau of Standards." Dr. William Blum, Baltimore-Washington Branch.
4. "Porosity Tests for Nickel Coatings on Steel." P. W. C. Strausser, Research Associate, A.E.S., at Bureau of Standards.
5. "Dropping Tests for Zinc and Cadmium Coatings on Steel." A. Brenner, Chemist, Bureau of Standards.
6. "Further Study of Measurements of pH in Alkaline Plating Solutions." M. R. Thompson, Chemist, Bureau of Standards.
7. "A Study of Silver Plating for Industrial Applications." C. S. Love and A. C. Simon, Metallurgical Division, Bureau of Standards.

Ladies' Program

Sunday, June 18th.

2:30 to 4 P. M.—Registration.

Monday, June 19th.

10:00 A. M.—Attend Official Opening.

2:00 to 4:00 P. M.—Get-together Tea.

8:00 P. M.—International Fellowship Club Open House.

Tuesday, June 20th.

10:30 A. M.—Breakfast, Hotel Monterey. Presentation of Gifts.

Afternoon—Open.

7:30 P. M.—Theatre Party. Ladies will meet in the main lounge. Theatre is a short distance from the Hotel.

Wednesday, June 21st.

10:30 A. M.—Buses leave for shore drive and the New Jersey Governor's summer home at Sea Girt; Luncheon at the Marine Grill, Asbury Park.

Evening—Open.

Thursday, June 22nd.

Morning—Open.

2:00 P. M.—Bingo Party—Hotel Monterey. Sponsored by International Fellowship Club.

Joan Trumbour Wiarda, Official Beggar.

Refreshments served through courtesy of Ladies' Committee, Newark Branch.

7:30 P. M.—Banquet.

International Fellowship Club Convention Bulletin

Annual Luncheon

Monday, June 19th, 12:30

Berkeley Carteret Hotel

Election of Officers; Arrangements for Open House; Group Photograph.

The annual meeting offers an opportunity for all supply manufacturers, jobbers, branch managers, and representatives to meet in a friendly atmosphere to discuss matters of interest in the industry.

Monday, June 19th, 8:30 P. M.

Berkeley Carteret Hotel.

Dancing 8:30 'till 1:00.

Buffet Lunch will be served at 10:00.

Music by Dave Hughes and his Orchestra.

This affair is one of the outstanding features of the Convention and provides an opportunity for all those who attend to become better acquainted. Each Registration Booklet contains a ticket for admission. The entire expense of this affair is borne by the manufacturers and jobbers selling to the Industry. Our contributors and their representatives cordially invite you to enjoy this evening with them.

Ladies' Party

Thursday Afternoon, June 22nd.

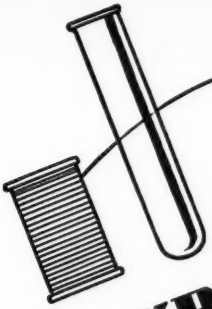
Hotel Monterey.

Surprises are in store for all.

This party is held under the auspices of the Fellowship Club in cooperation with the Ladies' Committee of Newark Branch.

Golf Tournament

Time to be determined.



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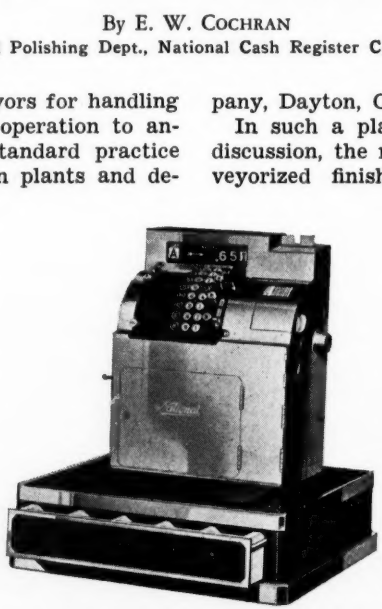
Use of Conveyors Expedites Production in Plating Department

Where production is great enough to warrant, conveyorized equipment provides for smooth operation and minimum handling costs.

By E. W. COCHRAN
Foreman, Plating and Polishing Dept., National Cash Register Company, Dayton, Ohio

THE use of conveyors for handling parts from one operation to another has become standard practice in modern production plants and departments, but is still very rare in the finishing department. This apparent "lag" in modernizing may not be so much the fault or lack of effort on the part of production or conveyor engineer as to the inability to systematize the finishing operations or to lack of need for systematic handling in this department.



The Class 1900 National Cash Register is housed in a chromium finished cabinet.

Where production is small, automatic handling in the plating department may fail to effect sufficient economies to make it worthwhile. However, as production increases, the need for mechanical handling increases and in such a plant as that of the National Cash Register Company, Dayton, Ohio, is imperative.

In such a plant as the one under discussion, the merits of a fully conveyorized finishing department are obvious. Workpieces are not permitted to accumulate at any one spot; consequently, the production progresses through the plant smoothly and without any inteference that might cause delay or complete shut down. In addition, all operating departments have been carefully coordinated to keep the plant working efficiently at all times. With the handling of parts between the various finishing operations reduced to the minimum, a very noticeable decrease in the number of rejected parts has resulted.

The major portion of the work that is plated in this plant consists of

Fig. 1—View of the polishing department, where both cast and steel parts are polished before plating.

small castings and a wide variety of stamped steel parts which range from less than one inch in size to several feet square. The cabinet frame of the cash register is the largest single stamped steel part that is plated in the N. C. R. plating department. The one-piece welded construction of this frame assures rigidity and maximum length of life under severe service conditions. The evenly distributed coatings of both nickel and chromium plate obtained on the cabinet by means of continuous process, semi-automatic equipment have been made possible through the constant application and adoption of the best and newest developments in the field.

Cast parts, after rough grinding and pickling in muriatic acid, are transferred from the foundry to the polishing department to join the flow of stamped steel parts that arrive from the stamping and welding departments. A single line of production is then followed through the various plating solutions, dips, rinses,

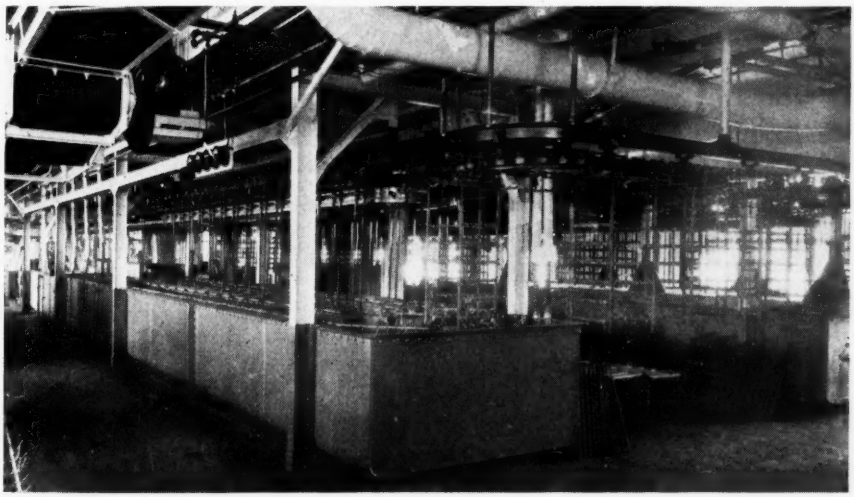


Fig. 2—Small parts racked on spring clip plating racks are plated in the tanks shown here.

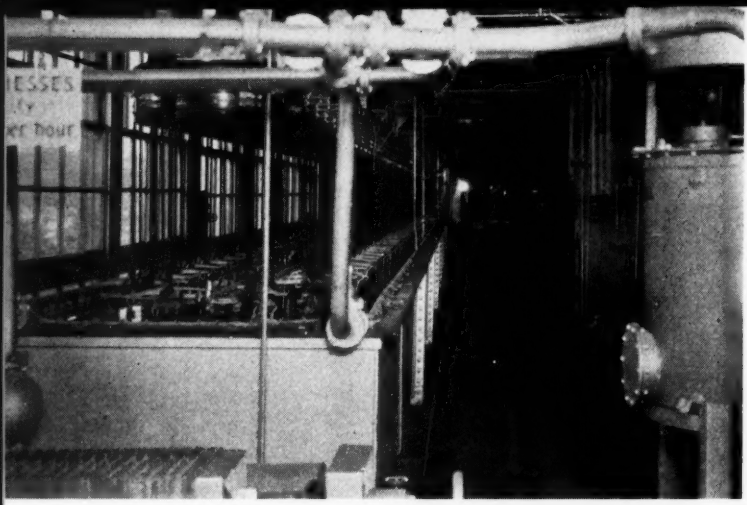


Fig. 3—The 7,800 gallons of bright nickel plating solution contained in the tank illustrated here is filtered continuously.

•

and so on.

Since the cabinet frames are of all-welded steel construction, there usually remain surface welds which must be removed by polishing before plating. Fig. 1 shows a view of one section of the polishing department through which all stamped steel parts and cast parts pass to be polished before nickel and chromium plating. Two types of conveying systems for conveying parts through the department are shown in this illustration. One is the belt conveyor overhead and the other is an overhead trolley conveyor located conveniently over the line of buffing lathes which are positioned along the window wall. The workpieces can be taken from this conveyor and re-

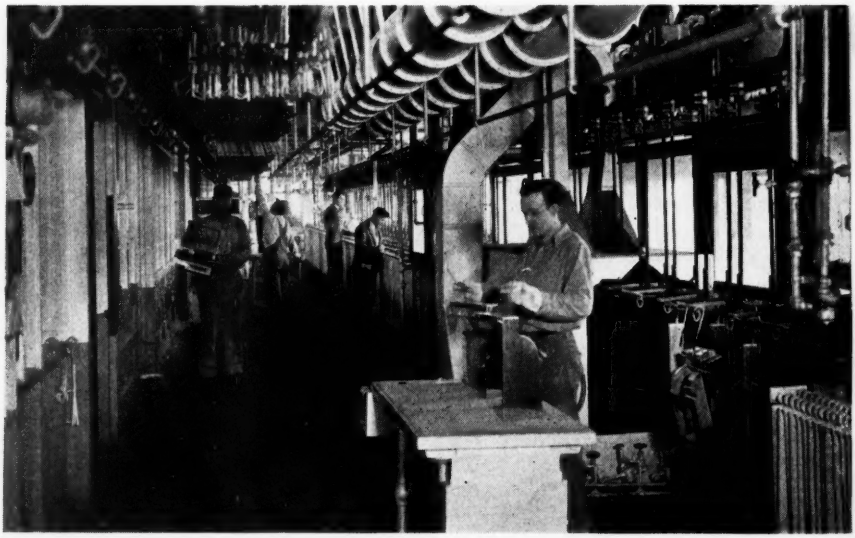


Fig. 4—The department in which the bright nickel solution is located is glass-enclosed and thus separated from the rest of the plant.

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placed when finished, thus eliminating the problem of banking parts to be polished and buffed.

The polishing operation is performed on five wheels, starting with 120 grain and finishing on a 200 grain felt polishing wheel. All final coloring, when necessary, is done with a felt wheel.

After the workpieces have been carefully polished and buffed, they are inspected for the quality of the polished finish. A thorough examination of all parts for any minute imperfections at the beginning of the plating cycle saves both time and labor and also eliminates the possibility of rejects at the final inspection.

Maximum lighting is provided by large windows that are located opposite the polishing lathes and also by means of the large artificial lights located above. Small parts that cannot be hung individually on the

Fig. 5—A view of the chromium plating department showing stands in the foreground where racks are hung while workmen load them with workpieces.

overhead conveyor are placed on tray racks, which, in turn, are suspended from the hooks of the overhead conveyor for transfer to the degreasing department. Following the polishing operation, the workpieces are passed through a Blakeslee automatic degreasing unit to remove all grease and oil. The degreasing process takes place in two stages. The work is first passed through a solvent consisting of trichlorethylene and then through a vapor section of the

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same solvent.

A view of the plating department to which the small parts are conveyed for nickel plating is shown in Fig. 2. As the parts enter the department, they are removed from the conveyor and placed on insulated racks which are hung on the conveyor of the nickel plating tank.

Figure 3 shows a view of the glass-enclosed bright nickel plating room. The unit shown in this illustration is an automatic nickel plating machine. In conjunction with this unit is an alkaline cleaning solution through which the racked workpieces are passed prior to an acid dip and the bright nickel plating operation. Immediately following the alkaline cleaning operation and also following the acid dip, the pieces are thoroughly rinsed to remove whatever contamination remains on the parts following the respective dips. After the acid dip and rinse, the parts are ready for the bright nickel plating solution.

Where necessary or advisable due to the shape of the workpieces, auxiliary anodes are hung on the same carriers with the work or upon the carrier immediately preceding and following the work that is to be plated. One of the features of the bright nickel plating department is the use of continuous filtration of the plating solution. The equipment used for this purpose is shown in the foreground in the illustration. A clean solution is good insurance against pitted and spotty plated work.

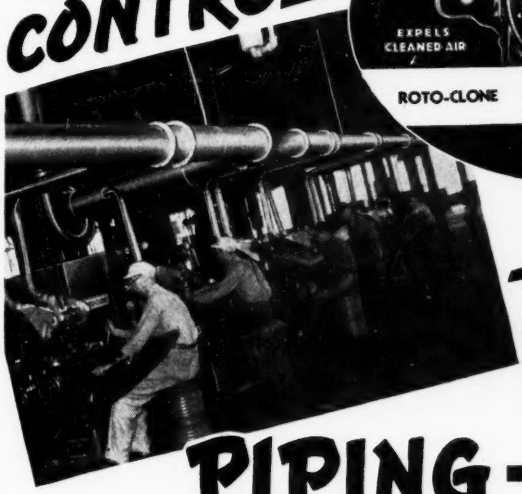
The deposits of bright nickel obtained under specification during the normal plating time varies little from 0.00075 in. An idea of the size of the tank, shown in Fig. 3, may be gained from the fact that the tank holds 7,800 gallons of bright nickel solution. Another view of the bright nickel plating department is shown in Fig. 4.

Following the deposition of the bright nickel plate, the parts are rinsed and transferred to the chromium plating department, a view of which is shown in Fig. 5. In this department, the workpieces are removed from the nickel plating racks and placed on insulated racks for the chromium plating process. Fig. 6 shows a view of an operator racking National Cash Register trade mark plates on the chromium plating racks. As shown in this illustration, these racks are of the spring clip type which hold the workpieces firmly during the plating operation.

Conforming or auxiliary anodes are used to obtain coverage in recessed areas or on areas where throwing of metal is more diffi-

Fig. 6—The operator shown here is placing National Cash Register trade marks on chromium plating racks.

DUST CONTROL



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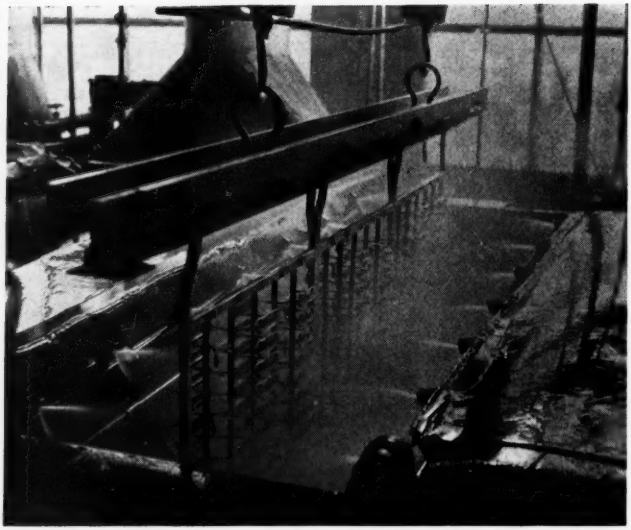

Fig. 7 — A spray rinse is used to reduce chromium plating solution drag-out loss.

cult. To prevent the metal from burning or the chromium metal from piling up on the work, bleeders or thieves are used. Ordinary steel wire used for this purpose is attached to the negative side of the rack and aids greatly in obtaining smooth and even deposits of metal.

A drag-out spray rinse follows chromium plating. A view of this rinse in operation is shown in Fig. 7. The spray is directed downward against the workpieces, thus forcing out any chromium plating solution that has been deposited in recesses or crevices. The solution obtained from the drag-out is used for making additions to the plating bath. The thickness of chromium plate obtained according to specification is 0.00002 in. When necessary, the chromium plate is color buffed, otherwise the cabinet frame parts are passed through the regular routine final inspection and transferred to stockrooms where they are stored until ready for use.

o

"From A Cleveland Laboratory." The Sherwin-Williams Company, 101 Prospect Ave., N. W., Cleveland, Ohio, has just released a 24-page pictorial and technical report in color, on what is said to be one of the most interesting developments for wide industrial use in paint history. A product described is the S-W Kem Lustral Enamel, a versatile finish that can be brushed, sprayed, dipped, air-dried or baked, and applied to metal surfaces subject to interior or exterior exposure. Kem Lustral is said to serve 1001 specialized product finishing and maintenance needs and sets a standard of quality at low material cost.

Kem Lustral is said to produce a smooth, mirror-like finish of remarkable sales appealing beauty, and to maintain its toughness, gloss and color exceptionally well under exposure.

Several outstanding qualities of Kem Lustral Enamel are greatly simplified finishing schedules, and new opportunities to improve quality and cut costs on finished units.

Kem Lustral Enamel is available in all colors. It is built around a new kind of synthetic resin and this resin is said to be responsible for the unique working qualities and beauty of this enamel. Kem Lustral is recommended for innumerable finishing tasks, ranging from small toys and utensils to metal stadiums.

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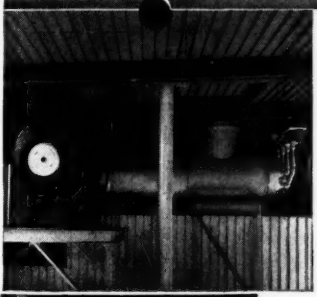

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Barrel Finishing of Metal Products

A brief discussion of the current practice in the barrel finishing of plastics.

By H. LEROY BEAVER

DURING the past four months the writer of this series has personally appeared before and spoken to a number of the local branches of The American Electroplaters Society on the general subject, "The Barrel Finishing of Metal Products." Either during the course of, or after every one of these meetings, the question of what to do about the finishing of plastic materials in barrels was raised. Had I conducted any research in the matter—what were my conclusions—was the practice as at present used practical—what were the best materials to use and the best manner in which to apply them—how did the operation compare with the finishing of metal products and why couldn't the same methods be used for both.

The readers of this series are, of course, familiar with the fact that thus far the discussion has all been based on operations to be performed on metal products either in preparation for plating or some other form of subsequent finishing or else barrel operations following the deposition of the plate.

We have been asked at one time or another such questions as how to separate small rubber wheels used on toys from a complete molded matte, remove the projections or fins and deliver the wheels from the barrel completely finished in one operation—to devise a method for finishing horse shoes in a barrel both before and after cadmium plating and also barrel methods for burnishing pipe in ten-foot lengths—but these are not much further removed from the customary metal finishing practices than to go direct from metals to such an entirely different product as the present day plastics.

During the past thirty years we have probably had more different parts made from a wider variety of materials in our barrels for research experimentation than any other organization in existence and it would be strange indeed if plastic materials had not also had their share of attention though not to so great an extent as have the various metals formed into a multiplicity of products through regular manufacturing channels.

Briefly then, we understand the invention of the modern plastic is gen-

erally credited to Dr. L. H. Baekland, who previous to plastics had won considerable attention as the inventor of what is familiarly known as Velox photographic paper. Sometime in 1907 he succeeded in producing something entirely new and for which there was no known natural equivalent. His product had one new characteristic. It rather resembled a natural resin, was soluble in alcohol and acetates and would melt. However, when heated and subjected to pressure its nature changed completely (a chemical process called "polymerization"). It became hard, indifferent to heat and wholly insoluble by any agent. It was tough, hard, smooth, mechanically strong and current resisting. Thus we had Bakelite, a material of thousands of uses, far too many to be specifically enumerated.

From this beginning, down to the present time, literally hundreds of varieties in plastic materials have been developed and introduced and in every color of the spectrum, varying through all shades and tints into the delicate pastel shades, marbelized effects and a wide variety of tone color combinations that have lent themselves to a wide line of decorative features as well as altogether practical applications in a wide variety of parts for everyday use. Most of the interior trim for automobile bodies, and for household appliance plastics are rapidly coming into wider and wider favor and it is not strange that interest in methods for the commercial finishing of the plastic parts should be paramount.

The methods of forming the plastic materials into commercial blanks vary. Some are molded under pressure in so-called "injection" machines, using granulated plastics such as acetate, urea or tenite while others are molded from bakelite powders, duer, and so on. The various names given to these plastic materials by various producers are almost legion, and it is not our intention to even undertake to mention specifically even a small part of them.

Irrespective of the type of mate-

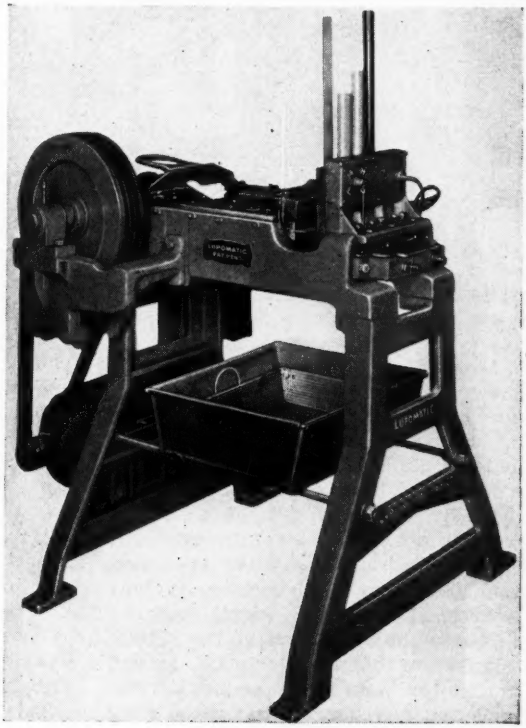

Fig. 1—Illustration showing a "wasteless" type of plastics slicing machine.

Fig. 2—An abrasive cut-off wheel machine for forming plastic blanks.

rial the processes used for finishing such parts in barrels follows pretty much the same general procedure on all, but the barrels, with respect to size, shape and general construction and operation as well as to the materials used in processing are very decidedly different from what would be used in finishing average metal products by the use of steel balls and steel shapes with a soap lubricant, even though generally the operation of the barrels themselves follow somewhat the same general rules.

As to the formation of the plastic blanks in the first instance, among many the impression seems to prevail that anything that is made from plastic materials must be either injection molded or else turned from the plastic material in rod form. This is, of course, not true because thousands of products are made from plastic materials which are sliced from sheet, rod or strip material, while many others are cut from commercial shapes by machines equipped with flexible abrasive wheels. Many of the plastic parts available today at almost unbelievable prices would not be possible were it not that the blanks are first formed either by slicing or abrasive wheel cutting. It it not unusual for these slicing machines to produce anywhere from 20,000 to 60,000 blanks per hour and these slicing machines, a popular one of which is illustrated in Fig. 1, will handle rod stock from ⅛ in. up to 3 in. in diameter.

The plastic material is first softened for slicing by immersion in hot water and then fed into the machine, the action is rapid, clean cut, and many of the blanks from which commercial plastic parts are made are first formed in this way.

In the abrasive wheel type of forming for plastic parts the operation is performed wet and also the material in whatever form the raw stock may be is fed into the machine either by hand or force feed. Such an abrasive wheel machine is illustrated in Fig. 2.

This abrasive machine, when taken

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with the illustration of the slicing machine shown in Fig. 1, represents the best of the currently developed machines for the particular purpose for which they are intended. We thus see that these blanks of plastic materials may come to the finishing barrels either molded, turned from rod, sliced or cut with an abrasive wheel operation.

Burnishing soap solution and steel balls or steel shapes cannot be used in plastic finishing. We tried that back in 1927 before we knew as much as we now know about the relation of specific gravity of the finishing material and the parts to be finished. We at that time even tried rough ground steel balls where the surface was not unlike the serrations on a file, but to no avail. We then coated the steel balls with glue, depending on the rough surface to act as a binder and then rolled the glue coated ball in fine abrasive materials, still to no purpose save to badly scratch the surface of the parts first because the finishing medium was entirely too hard and secondly because the plastic parts due to their lesser specific gravity or lesser inertia simply floated on top of the mass. From this we learned that the binder medium, irrespective of its composition, or the base material on which it is placed, must be soft and pliable, and the whole naturally of lesser specific gravity than that of the parts we desired to finish.

Prior to 1920, celluloid parts were to some extent finished in barrels by a wet method, which was sloppy in the extreme, and most everyone at that time feared to undertake any method that even leaned toward dry finishing because with the materials then used, the barrel speeds and the amount of heat generated in the process, the danger of trouble arising from the creation of static sparks in a mass of dry materials rubbing together was very great. Some barrel finishing was undertaken on plastic parts by tumbling them in a solution of vienna lime and water for from 18 to 24 hours to smooth the surface, followed by a finish tumbling operation in an oblique tilting type of wood barrel using sheepskin scrap as the burnishing medium, and while we thought the finishes obtained in this way were pretty elegant, in the light of present day methods and results, the finishes we then obtained in this way would not be acceptable today even on two operation finishes such as is given

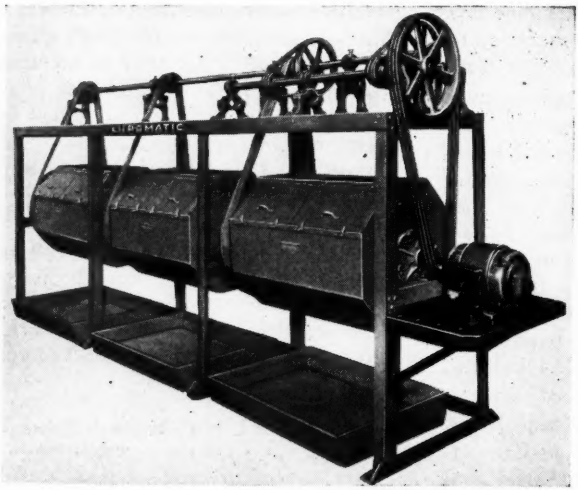

Fig. 3—A triple barrel assembly for providing the three-step finishing cycle required for finishing plastics.

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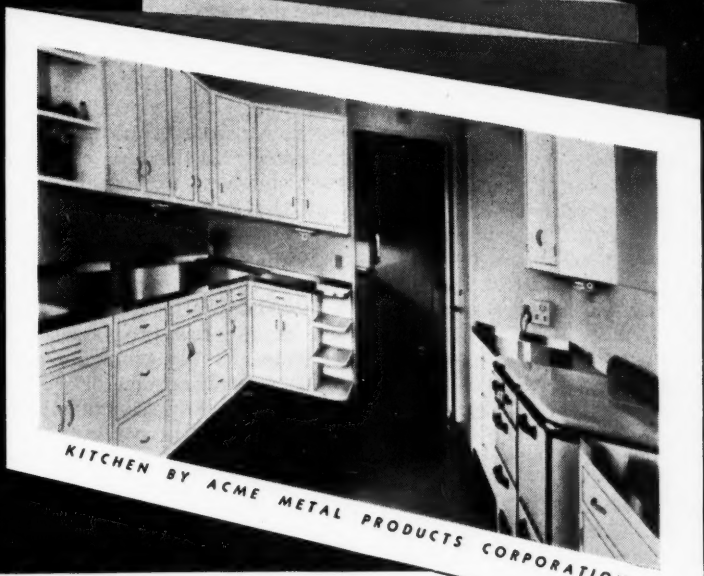

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The method of hand polishing plastic parts with wheels and abrasive composition such as tripoli are about 60 per cent equal to the same operations on metals, but as we have indicated, the barrel finishing of plastics is very much different in procedure from what would be used on metal products.

Coming now to the kinds and sizes of barrels applicable for the finishing of plastics we find that they differ very materially both in construction, operations and general appearance, from those used on the average barrel finishing application on metals. Generally speaking, a satisfactory size of barrel might be 16 in. wide by 30 in. in diameter, and we could almost designate this as an all-purpose barrel size. Barrel sizes commonly used in the process of plastics finishing are 24 in. x 48 in.—2 compartment; 21 in. x 48 in.—6 compartment; 30 in. x 48 in.—2 compartment; 30 in. x 42 in.—2 compartment and 24 in. x 36 in.—2 compartment, and barrels in these size ranges may be had in either all-maple construction or else with light steel shell maple lined. The maple lined steel shells seem to be the variety most preferred for the reason that they are more stable; there is no leakage at the joints to provide for dust to sift through, and the liners are very easily replaced when worn.

We have been asked why, in connection with plastics finishing, some of the barrels that are offered are shown in illustrations to be in banks of three high and in some cases two high while others are shown strung out in line such as those illustrated in Fig. 3. In the three barrel high type the prime consideration in mounting them in this way is the conservation of floor space, and you will seldom find this type offered or recommended unless for this specfic reason. Banks of barrel two high are entirely practical both from an operating as well as a floor space conserving installation, while the three barrel units strung out in line are, of course, to be desired where the necessary floor space is available. Double and triple mountings of this sort would hardly be considered practical in barrel finishing metal products with steel burnishing material because of the great difficulty that would be had in both loading and unloading the barrels with their greater weight of materials. The finishing materials used on plastics being comparatively light are rather easily handled in the double and triple bank installations.

While it is true that plastics have surged into popularity very strongly in a comparatively brief time, there are only a few processers we would consider as being in the "big business" classification. For the most part, the plastic finishing industry up to this time is confined to mostly what we would term the small type of manufacturer. Naturally, anything coming into popularity so quickly would excite a lot of attention and in this way we have a lot of small processers mostly struggling along, due perhaps to the very strongly competitive state of the business at this time.

As we well recall when chromium plating was first introduced it was predicted that all other metals, in the face of chromium, must rapidly find themselves in the discard, a prediction that was never realized, and we can see no reason for the same sort of hysteria among the plating fraternity in the case of plastics. In many cases we suspect that, like in the case of chromium, the wish was father to the thought, and while plas-

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tics can and do have much in the way of beauty and utility, they are also limited in their applications. We need only to look about us to see that in a very great majority of their applications they are really used as a decorative adjunct to an electroplated metal product. Even should they come within the scope of interference with the present activities of the plater, it will not be at all difficult for any average intelligent plater to very quickly grasp the essentials of the finishing operations involved in plastic products, and such finishing can and eventually will likely be a part of the facilities of any average general plating establishment. Even though the equipment necessary for the finishing of plastics differs from that used in the finishing of metal products generally, it is not expensive either in first cost or operation, and the compounds and materials as at present used in the process are readily available and comparatively inexpensive.

Now as to the compounds, so-called, that are the basis of the current finishing practice. Some of our inquirers have asked why they should be so surrounded with mysterious symbols such, for example, as Material 1 CP and Material 2 CP. There really is nothing mysterious about these designations, and we doubt very much whether manufacturers of the materials using them ever intended that they should be mysterious in any sense. The "Material" part of the designation merely signifies maple wood fibre (it is hardly fitting to call the material sawdust, because it is specially ripped from maple wood to secure as nearly as possible a jagged wood fibre form, fairly close to size) and differs from average run of mill sawdust. The initials C. P. simply mean "Chemically Prepared," so that Material 1 C. P. would mean Maple Wood Fiber Chemically Prepared and blended with either polishing or abrasive material number 1. The same would be applicable to number 2, or as the case might be. It provides a simple form to designate a given form of material.

The Chemical Preparation is a combination of various waxes and solvents, no one of which will function satisfactorily by itself, because continued research has determined the proper combination, and the waxes and solvents are blended with the proper abrasive polishing mediums so that the action instead of being hard and harsh as would be the case with a hard glue set up material, is soft and pliable, and necessarily so in the case of plastic materials. In addition to this, their action is very largely controlled by the degrees of heat generated within the barrel while the process is in operation. While we are quite familiar with all of the combinations of materials, we feel that it would be a little less than fair to disclose them, for they constitute the "stock in trade" of manufacturers who have spent years of time and thousands of dollars in the research required in their development. Sufficient to say that of the abrasive and polishing materials used they almost run the entire gamut of Mohs' scale of mineral hardness.

Depending on the type of first forming of the blanks, different procedures are employed. Articles that have been molded from Bakelite powders and have a fin or flash are generally given a preliminary operation in what is termed a "screen barrel" where ordinarily in from 10 to 30 minutes of operation as much as 85 per cent of the fins are removed, and in further processing the surface even where these gates have been broken off in the screen barrel, comes up

with a fine finish generally acceptable to the customer.

Now, aside from the chemically prepared mixtures as previously described, the only other material form used in the operation is hardwood pegs similar in type to the well-known "shoe pegs" which are used to attach uppers to shoe soles. In cases where pegs are used with No. 1 mixture, the pegs are impregnated with the same waxes and solvents used in the chemically prepared mixture but without abrasive. They provide the weight medium used in the process. Many suppose that the plastic parts are operated solely in the sawdust treated medium, but this is incorrect because only a comparatively small quantity of the C. P. mixture is used in proportion to the quantity of pegs.

Generally, in loading or charging a barrel pretty much the same procedure applies as in barrel finishing with steel burnishing materials except that in the case of plastics the proportion of mixture and pegs is generally started basically at from 2½ to 3 parts of C. P. and pegs to one part of the plastic parts. As in the barrel finishing of metal products, this is not a hard and fast rule but simply a basis from which one may work upwards or downwards as experience best dictates.

On some types of molded parts where the gates are very heavy, and on some turned parts, it may be necessary at times to use a machining operation on a spinning lathe or a sandpaper wheel followed by a short barrel operation with somewhat coarser and faster cutting abrasive in perhaps as much as a 70-30 mix to obtain a preliminary finish such as is generally secured by a process known in the trade as "ashing," following which the normal regular procedure is carried through.

It should be understood that the roughing operation, such as the one immediately heretofore described and the 1 CP and 2 CP operations are all preliminary to the final burnishing or polishing operation. In the latter, a composition also composed of various waxes and solvents is used with wood pegs treated with the same preparation, which in this case is known as a "burnishing cream." In operation the parts become warm, the temperature generally averaging from 85 to 100 deg. in winter and from 96 to 110 deg. in summer. These temperatures cause the wax solution to form a film which deeply impregnates the surface of the plastic, and which up to this time are operated in a closed barrel. Generally after 2½ to 3 hours of running in the burnishing operation, the solid door of the barrel is removed and a screen door fitted in its place. This permits cooling of the mass, after which the pressure of the wood pegs against the plastic parts seeking to pass through the mass as the barrel revolves, will, in from one-quarter to one-half hour, bring the parts up to a very brilliant and hard surface finish. This of course refers to the final or burnishing operation.

To those who might be interested in the weight of the materials, the 1 CP mixture will approximate 7 pounds to the peck and the 2 CP approximately 6 pounds to the peck, while the plastic parts will average two to three times this weight for an equal volume. It will thus be seen that at no time is there any difficulty in keeping the plastic parts well confined within the mass of finishing materials and pegs and they at no time float on top of the mass, as they would do if one attempted to use steel burnishing material in carrying out the process.

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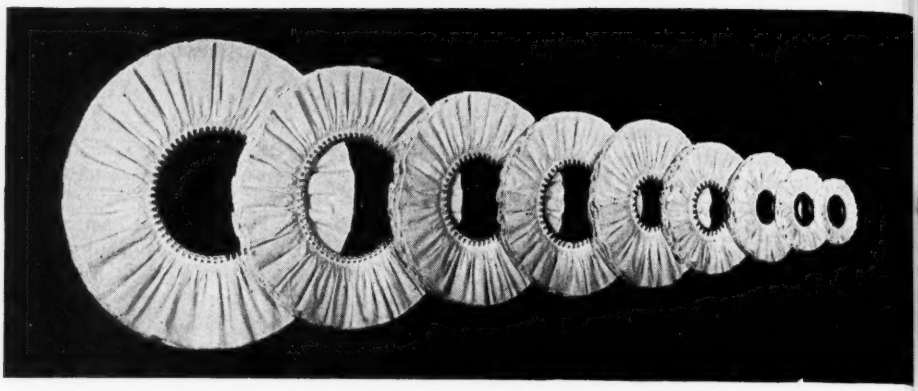

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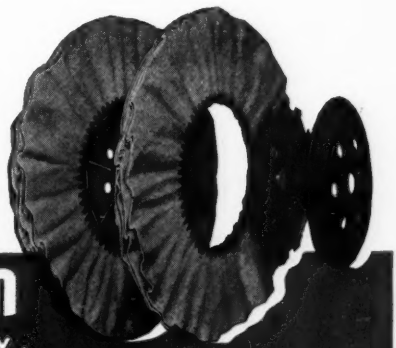

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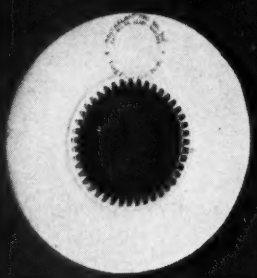

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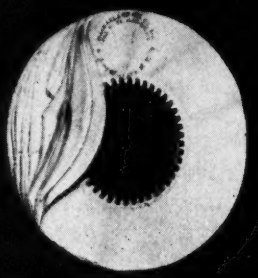

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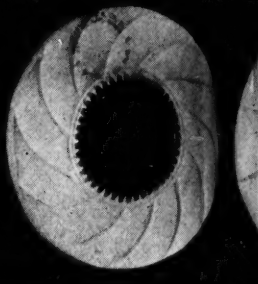

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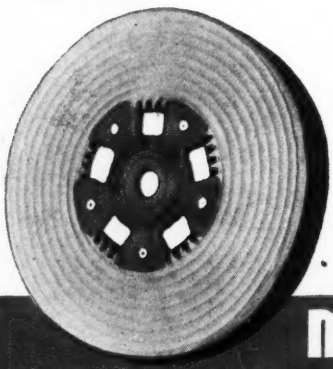

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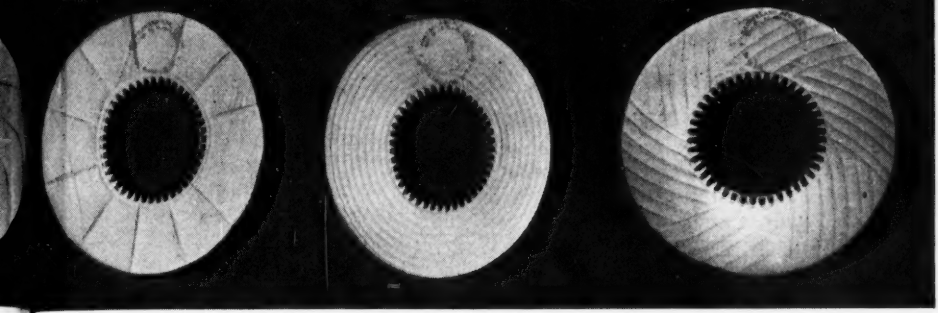

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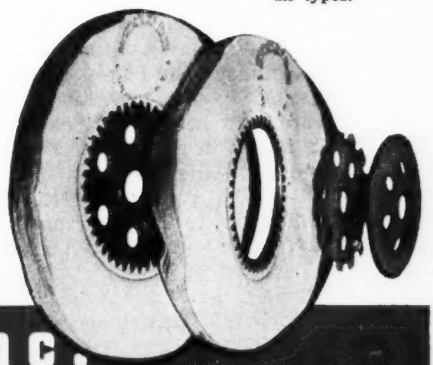

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Now as to nominal operating cycles. Parts made from cast resins, for example, and turned in automatic turning machines, or formed with automatic flexible wheel grinding machines are first placed in a barrel with the proper quantity of 1 C. P. Mixture and pegs and operated from 8 to 12 hours and in some cases as much as 16 hours. This operation removes tool marks or other defects and provides a smooth surface.

The second operation is much the same as the first, but not, however, performed in the same barrel. This operation requires finer materials and the operating cycle is from 12 to 16 hours and in some cases 18 hours. These two operations prepare the surface for the final or burnishing operation which is done with the cream solution and with pegs, no abrasive medium being used, and the time requirement for this final operation is generally 3½ to 4 hours in the barrel with a tight lid, followed by ¼ to ½ hour in the same barrel with the screen lid. Generally, the complete cycle for the finishing of plastic parts will run from 18 to 36 hours, including all three operations.

There is another reason why we see barrels for plastics finishing generally operated in groups of three, and that is that there are three steps in the process, three different finishing mediums and the barrels in each operation operate at a different speed. Taking a popular barrel size, say, a 30 in. x 36 in.—2 compartment, each compartment being 18 inches wide and 30 inches in diameter. For the first operation the speed would be from 26 to 31 r.p.m.; for the second operation 21 to 25 r.p.m. and for the third or final operation 29 to 35 r.p.m. Naturally the size of the parts and the degree of hardness of the plastic material largely dictates the proper barrel speed.

To give some approximate idea of production volume we might use, as an example, buttons of 1 in. size formed from plastic material which might be operated in one of the compartments of the barrel just described in lots of 35 gross or approximately 5,000 buttons finished per load in the three steps constituting the cycle.

To many the operating length of time for each operation in the cycle may be considered as excessively long, and by some it is argued that the process while mechanically possible, is not so satisfactory from a practicable point of view, and that in order, in some cases at least, to get out necessary production, too much equipment, hence too much floor space would be required. The writer recognizes all of this but points out that plastic finishing, even though much research has been done, is still comparatively new, and the search for other and different materials to speed up the production still goes on and eventually plastics will be finished in approximately the same operating time and under much the same conditions that now apply to the finishing of metal products of the same general character.

The writer wishes to gratefully acknowledge the courtesy of the Lupomatic Machine Co., Inc., 4510 Bullard Ave., New York City, for supplying the cuts used to illustrate this text, and to Mr. J. Bupo, Jr., for his invaluable assistance in checking up the text for accuracy of current procedure.

Air Motored Mixer Catalog. A four-page 8½ x 11 catalog describing a complete line of air motored agitators, both direct and gear driven, has just been published by the Pneumix Division, Eclipse Air Brush Co., Inc., 398 Park Ave., Newark, N. J. Many safety features and variable speeds are set forth, together with illustrations of actual installations of these mixers.

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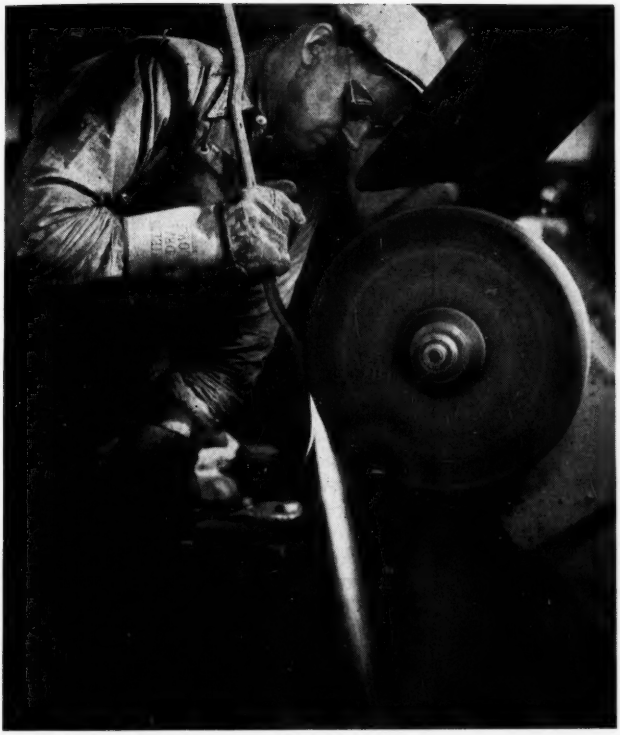
Mention PRODUCTS FINISHING when writing to advertisers.



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G-67

NORTON ABRASIVES

Thought-Provoking Problems in the Finishing Industry

By FREDERICK FULFORTH

Supervisor of Finishing, The Proctor Electric Company

SOME few weeks ago, the writer was consulted upon a problem of what appeared to be one involving a nickel plating solution, but upon closer analysis, the question evolved less in that category than into a method of polishing and purchasing, or rather the purchase specifications for raw materials.

It has frequently been found to be fact that such a supposedly knotty problem has eventually resolved itself into a simple solution opposite to the one originally indicated, and it is with this thought in mind that a few of these problems, personally met during the past year, are here presented in an endeavor to stimulate reader interest into constructive channels of thought for the invention of methods for their solution; or to at least give a feeling of superiority by the knowledge possessed by the reader of their simple solution, as opposed to the writer's lack of adequate information.

So many letters and comments have been received from previous writings on steel specifications that it would be logical to start with the specification problem as a beginning and advance from there, over a normal sequence of finishing operations.

The importance of this problem may be realized from the fact that the Research Committee of the American Electro-Platers' Society started last July to study the effects of basis metals on electrodeposited coatings in connection with their research associate, Mr. Paul Strausser, at the Bureau of Standards in Washington, D. C., under the direction of Dr. William Blum.

No results have as yet been published, but it is certainly permissible to speculate that the work must have been complicated by the difficulty in procurement of uniform strip steel, in regard to grain size, temper, and inclusions; as well as an adequate method for classifying and testing worked sections, especially for porosity before and after plating.

It is fairly well recognized that the independent cold reroller is in the best position to supply uniform strip steel, since his whole setup lies in specialty work rather than in the production of tonnage; in which position the hot roll mills support him by supplying coils of strip to his specification as rolled from their original billet analyses for his purpose.

Now the user of strip steel is primarily interested in obtaining a high finish, with adequate protection in some form against handling scratches

and die marks so that the fabricated stamping may be plated, so far as possible, without polishing, and to a large extent, with bright nickel, requiring no after buffing to develop high lustre.

One problem immediately appears and at one time was believed solved by the introduction of oiled paper between sheets, but the workability of oiled paper was found to be limited. It is believed that a much better substitute must be obtained which will have permanent adherence in intimate contact to the surface of the strip and yet sufficient flexibility to withstand at least right angle bending without cracking, while at the same time not increasing the net consumer cost beyond a small reasonable extra.

Latex and synthetic coatings have been proposed but the cost is believed prohibitive for even one side coverage, while the problem of protecting the other side against corrosion becomes acute when it is known that oils will interfere with the adherence of both of these compounds.

Or again, as recently expressed to the writer by the metallurgist of one of the independent rerollers, "If we could develop a paper which could be used while heat-treating our coils at 1,225 deg. to 1,350 deg. F., the problem of scratches would be solved, since we use and throw away as many as four sets of papers between leaves of coils elsewhere in our rolling, trimming, and so on, but must, so far, handle them in the annealing furnaces without inter-leaf protection."

Here, then, lie an interrelated series of problems for which there

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Call your local jobber now. If he cannot supply you, don't accept substitutes, just write

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must be answers.

Returning to the purchasers' further specifications, it appears impossible to consistently secure the finer grain sizes coincidental with soft tempers. The reason for a fine grain size is, of course, to obviate eggshell or orange-peel effect at bent sections, requiring polishing for removal or smoothing. However, if in securing the finer grain sizes it it necessary to roll so long and hard that the temper is greatly increased, the phenomenon of "spring back" results, in which case a right angle bend, when taken from the dies, flies open to a greater than 90 deg. angle—or, in the case of drawn work, the stock is so hard that it breaks out under pressure of the draw and creates a dead loss before completion. Here again are two closely related problems—really one—which no amount of excellent compromise has as yet been able to reconcile.

In the same connection while annealing, how much oil may safely be left on the coils for high finished stock? If too much, or the wrong kind, the pattern of its carbonization is apparent in the finish stock as wavy lines or ocean waves, while if too little or none, sticking and dry scratching result. Some chemist or metallurgist has yet to solve these problems, or perchance, you may be elected.

So much to indicate just a few of the posers in the manufacture, to say nothing of those in the fabrication, such as ability to clean or pickle any new surface protectors of strip stock previous to deposition without an additional expensive cycle therefore.

As to present day cleaning following fabrication, much controversy continues anent to degrease or not to degrease; or whether to alkaline clean. In one plant recently visited a large full automatic degreasing unit was standing idle because it was found to add nothing to the cleaning cycle, which had been enlarged to accommodate two alkaline cleaners of fairly heavy concentration, both with direct current or cathodic work connection.

In another plant, all alkaline cleaning was eliminated by a three-phase degreasing unit.

A personal theory in both cases, as yet unproved, was given credence by hearing our good friend, E. A. Anderson, of the New Jersey Zinc Company's Research Department, discourse on the theory of zinc base die casting cleaning wherein he mentions both methods and both in combination as practical, but stresses the necessity for timing and control permanence. That is to say, if the degreasing fluid was at a temperature of 180 deg. F. and doing a good job of cleaning, a sudden change to 190 deg. F. might upset the whole cycle, as would also time constant variation or a change in alkalinity of immersion time or excessive current fluctuation in the succeeding alkaline cleaner.

Frequently troubles of this kind lead to eventually cheaper procedures as may be cited in our own case, where the degreasing fluid was found to either fail to dissolve stearic acid in tallow polishing compounds, or to in some way combine therewith to form a film impossible to remove in alkaline cleaners unless previously hand wiped. The result was the adoption of a mineral oil, which was satisfactory so far as everything but cost was concerned and this was encompassed by the eventual purchase of crankcase drainings from a local garage at two cents a gallon instead of saponifiable grease stick at ten cents a pound. It was discovered that faster cut and higher

color lay in the mineral oil, while the degreaser has a greater affinity therefore and consequently removes everything sufficiently well to eliminate a hand-wiping operation.

There have also unquestionably been enormous advances made in polishing grains and wheels and the methods of bonding the two together for polishing purposes, but in nearly all cases these have been along previously established lines as further improvements; so that the art of polishing today is basically very little different from what it was in the past decade, barring mechanical improvements which only substitute the machine for the man but maintain the same basic equipment and sequence of operations.

Thinking along these lines leads logically to mechanical improvement in the use of solid abrasive wheels, with perhaps some of the newer bonds as evidenced, for example, in the ruber set emery grain discs used in smoothing sheet metal parts of automobiles previous to painting.

It is well within the realm of possibility that such wheels may with economy be entirely substituted for the present day "headed" ones; while even certain applications of solid inflexible bonded wheels, especially on cast iron polishing, may come to the front. Some experimentation has already been conducted among these possibilities and looks very promising so far as reduced costs are concerned although several "kinks" remain to be ironed out before publication of any details becomes possible.

The whole field is especially adaptable to cost reduction, particularly in the realm of hand-polishing operations to eliminate costly maintenance, depreciation and high overhead costs

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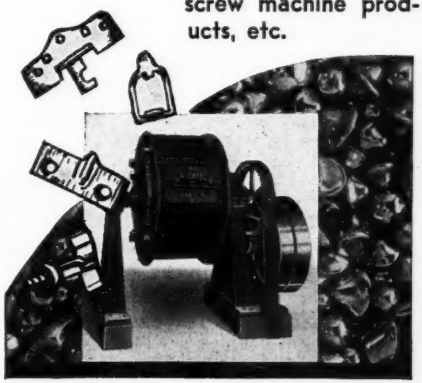
Pecks of work can be brightly finished at a time. High and narrow Abbott Barrels confine the load within a vertical area and direct pressure on the work. The surface of the metal is rolled down, making for a lustrous finish and increased resistance to corrosion.

Put it up to our Experimental Department to demonstrate on some of your unfinished parts. This free service may be the first step toward lower finishing costs. Worth a try, isn't it?

Stampings, spinnings, castings, forgings, screw machine products, etc.



The Abbott Ball Company

1060 New Britain Ave., Hartford, Conn.

of mechanical equipment and within the next few years some young fellow is going to lead the way and show us how.

The introduction of bright nickel on a commercially practicable basis has generated an increase in speculations on adaptions of mechanical equipment to its production and thereby create quite a few problems.

In the first place, it inherently plates so much faster that users are desirous of discovering its maximum deposition rate and incorporating the highest speed attainable into their equipments.

This ambition is accompanied by the necessity for greater solution agitation in some form in order to replenish the more rapidly depleted cathode film at higher current densities.

Some solutions are capable of withstanding either air agitation or propeller circulation in which case the optimum in current density, compatible with cost, is reached by the violence attainable without deracking the work when all other factors are equal.

Other solutions, however, are not so easily disturbed, as their wetting agent constituent creates a tendency toward excessive foaming upon increased activity and with these, the introduction of air, or rapid pumping, is impossible.

One such installation, recently visited, had been obliged to reduce their costly installed pumping circulation to one-fourth capacity and still experienced difficulty with excessive foaming, at a consequent loss in plating efficiency.

In order to overcome these troubles, the manufacturers of mechanical plating equipment first speeded up the chain which meant excessively long tanks at exorbitantly high overhead charges and still insufficient agitation to reach optimum current densities. Then, in order to keep down the length of machinery and tanks, various intermittent motions were introduced, some standing still except at transfer time, others up and down, still others oscillating and all as yet in the experimental stage, more or less, until the suppliers of bright nickel solutions are hard pushed to discover which, if any, are the best motions or at least which ones are usable with their particular solutions.

From all of this theorizing has developed another idea embracing various motions for the equalization of current density on all or nearly all surfaces of recessed articles with consequent uniform thickness and decrease in peeling.

Without further particularization, it is evident that much work remains to be done and many questions answered before Q. E. D. can be written after any of these propositions, and it is hoped that some plans may be laid at the approaching American Electro-Platers' Society Convention in Asbury Park, whereby better dissemination of advance information on all these questions may be more rapidly made to the users of electroplating and finishing methods through the members in charge of this branch of the work in their plants, or some medium of exchange set up whereby more manufacturers may be interested to a greater degree in the rapid solution of some of these problems as well as the many other and more important ones whose elaboration is prohibited by present space.

M & W Data Sheets on New Wrinkle Finishes. Data sheets, which give general and technical information on wrinkle finishes, are being distributed by Maas & Waldstein Company, 438 Riverside Ave., Newark, N. J. The M & W line of wrinkle finishes is said to have

greatly extended the usefulness of the ever-popular wrinkle finishes. The finishes are supplied in all colors, including pure white, light shades and pastels. The M & W wrinkle finishes are said to have low viscosity and consequently increasing covering power and can be applied with a uniformly fine grain, as well as coarse and heavy structures.

The data sheets, which will be sent free upon request, cover many details such as spraying air pressures, baking time and temperatures, method of obtaining various kinds of wrinkle, patching, and so on.

Binks Spray Painting and Finishing Equipment Catalog No. 73. One of the most complete catalogs ever printed on spray painting and finishing equipment is now being issued in the form of an 86-page catalog designated as "Catalog No. 72" by Binks Manufacturing Company, 3114-40 Carroll Ave., Chicago, Ill. A full index listing the various pieces of equipment that are included in the catalog is printed on the second page of the catalog. All of the items described are also illustrated and tables of specifications and prices are also included.

A copy of "Binks Spray Painting and Finishing Equipment Catalog No. 73" will be sent to any metal-finishing department executive who will send his request on his firm letterhead to Binks Manufacturing Company, 3114-40 Carroll Ave., Chicago, Illinois.

"Mathews Conveyor Handbook Catalog No. HB39." A handbook designed especially for engineers and plant operating personnel designated as Catalog No. HB39 is now being issued by Mathews Conveyor Company, Ellwood City, Pa. This catalog handbook is pocket size 4¾ in. x 6½ in. overall, and contains

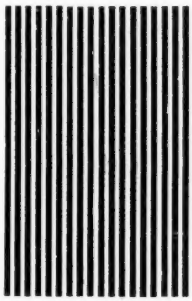
Mathews Conveyer Handbook Catalog No. HB39

384 pages of engineering material describing and illustrating practically every type of conveying mechanism available.

The Mathews Conveyor Handbook will be sent to any finishing department executive without obligation who sends his request on his firm letterhead.

"Profit . . . With Safety." This is the title of a four-page catalog which is now being issued by Ronci Machine Company, 45 River Ave., Providence, R. I. The Speedip Whirl Enameler is described in this catalog. This machine is a combination dipping-whirling machine for completely coating large quantities of small parts with lacquer, enamel, paint, or any other liquid finishing material.

A copy of "Profit . . . With Safety" will be sent free upon request.



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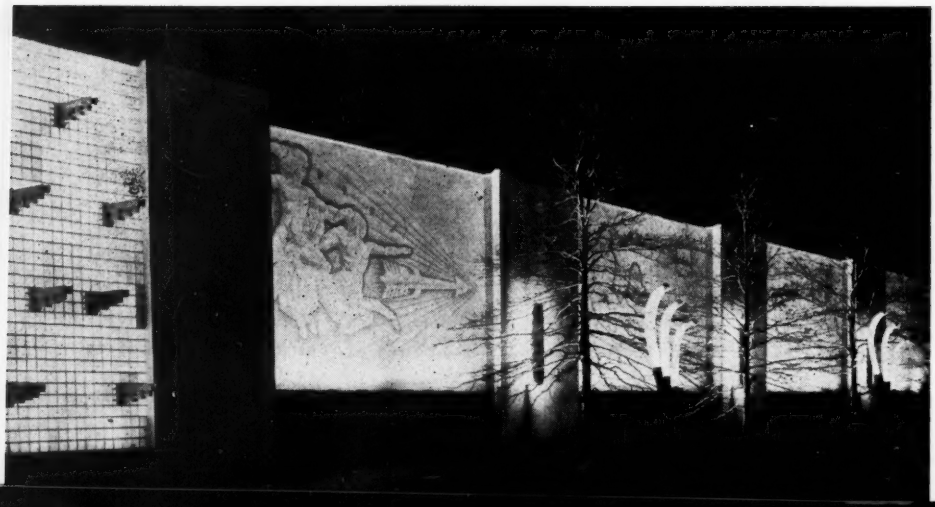
Branch Offices and Warehouse Stocks in Principal Cities

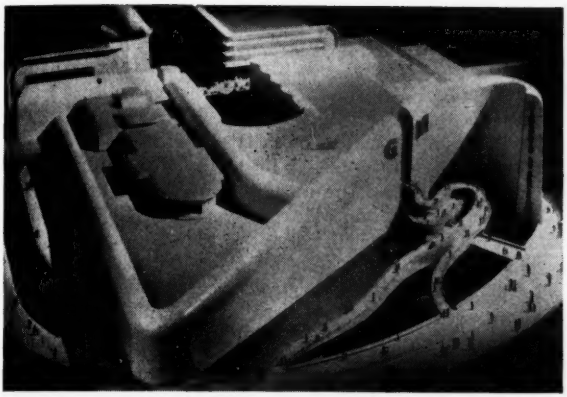
Normal construction practice is reversed in this building, which was erected by the United States Steel Corporation. Structural members are on the outside, with walls and roof underneath. Workmen have recently completed sheathing the dome of the building in stainless steel.

Metals Exhibits at the New York World's Fair

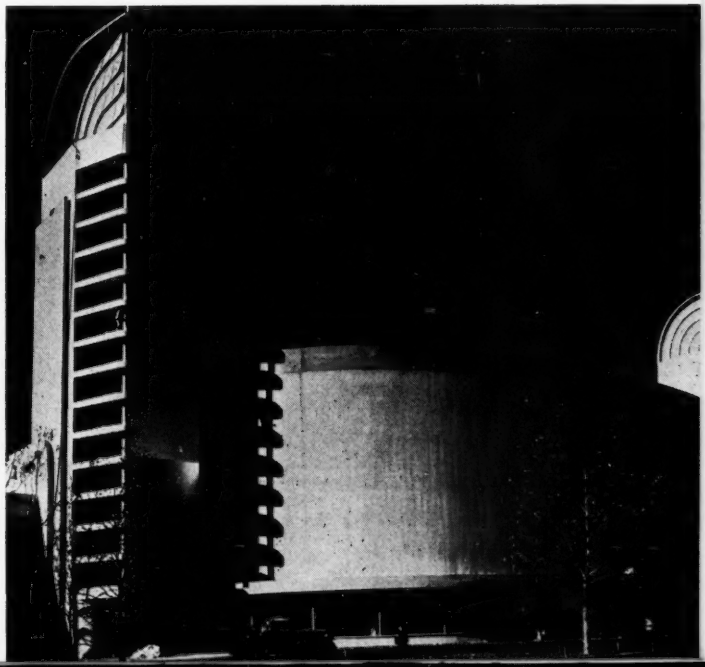
A night view of the Metals Building at the New York World's Fair. Note the glass brick background for the fountain and, at the right, the unusual light standards.



Erected by the motor car manufacturer whose name it bears, this building will house not only an assortment of manufacturing equipment in operation so that the visitor may see what an automobile factory looks like on the inside, but will also contain a half-mile "Road of Tomorrow." Walter Dorwin Teague was the designer.



The General Motors exhibit building, illustrated at the left, was designed by Norman Bel Geddes — world-famous designer—to present the displays of the various units in the Corporation. To be known as "Highways and Horizons" and in keeping with the World's Fair theme of "Building the World of Tomorrow," the exhibit will present a conception of future motor traffic regulations and superhighways.



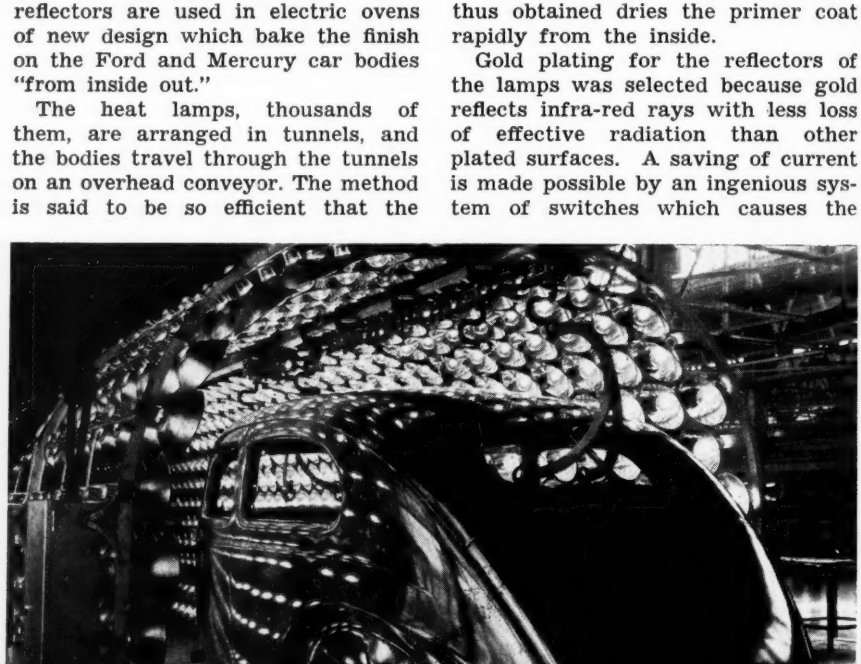
This building, which will house the Chrysler Corporation's exhibit at the Exposition, occupies a three-acre plot on the west side of the transportation zone between two of the Fair's main entrances. The building will also contain the Transportation Focal Exhibit featuring a simulated departure of a rocketship for an interplanetary rocketport.

Heat Lamp Reflectors Gold Plated at Ford Plant

PLATING heat lamp reflectors with gold is one of the more surprising of the hundreds of diverse operations conducted within the 1,096-acre River Rouge plant of the Ford Motor Company, Detroit, Mich. The reflectors are used in electric ovens of new design which bake the finish on the Ford and Mercury car bodies "from inside out."

The heat lamps, thousands of them, are arranged in tunnels, and the bodies travel through the tunnels on an overhead conveyor. The method is said to be so efficient that the primer coat is baked in 15 minutes. This speed, Ford engineers who developed the method explain, is the result of using infra-red rays which penetrate the primer coat and heat the metal underneath. The heat thus obtained dries the primer coat rapidly from the inside.

Gold plating for the reflectors of the lamps was selected because gold reflects infra-red rays with less loss of effective radiation than other plated surfaces. A saving of current is made possible by an ingenious system of switches which causes the



A Ford car body entering one section of the 90-foot tunnel of infra-red heat lamps.

lamps to go on as a body approaches and to cut off automatically after it has passed through a tunnel. In this way, a wave of radiant heat accompanies each body through the tunnel, which is built in two 90-foot sections. The heat lamps are fitted with 240-watt carbon filament bulbs.

The reflectors are made in Flat Rock, Mich., in the company's lamp plant, one of the dozen Ford "village industries." They are stamped from brass, polished and buffed to a high lustre, and nickel plated. The reflectors are then shipped to the River Rouge plant where they are gold plated.

By careful determination, it has been found that a piece of 24-karat gold 1/16 in. thick, 1½ in. sq. and weighing 45 grams is sufficient to plate approximately 500 reflectors. The actual time of plating requires 50 seconds.

Approximately 14,000 of the gold plated heat lamps are now in use in the River Rouge body finishing department, and others are being made as the application of this type of enamel baking method is extended. In order to keep the reflectors at top efficiency, approximately 200 are removed daily from the tunnel and replaced by spares while they are being cleaned or replated.

The infra-red process of drying finishes was developed in the plant especially for baking Ford synthetic resin enamel, which retains its lustre and color for the life of the car.

Blast Tanks for Pressure Cleaning. The W. W. Sly Manufacturing Company, 4700 Train Ave., Cleveland, Ohio, has just issued an attractive two-page bulletin on Sly "PB" Tanks for pressure blast cleaning. This bulletin describes the features of Sly "PB" Tanks for cleaning scale, molding sand, dirt and old paint from the surfaces of forgings, castings, as well as preparing the surfaces for metal coating, etching, and so on.

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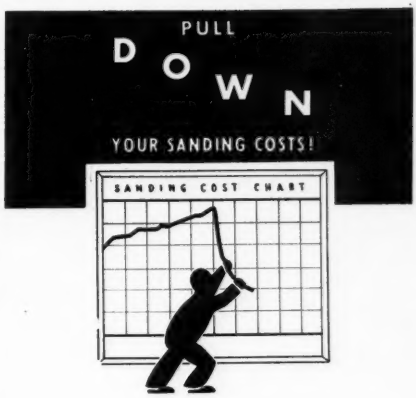

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A demonstration costs you nothing. Being without a Sterling DOES cost you something. Ask for a demonstration NOW.

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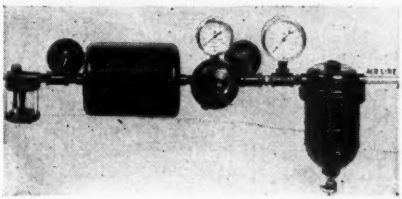
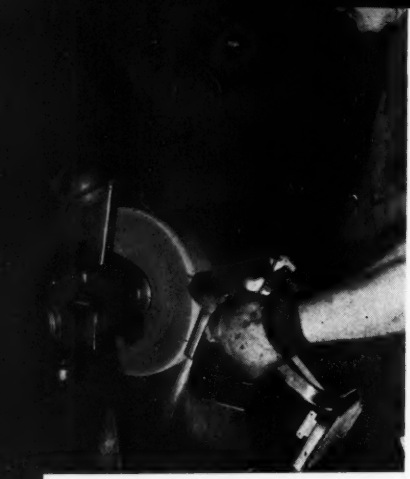




NEWS of the Industry

MacDermid, Incorporated, Announces Sales and Service Representatives

According to a recent announcement made by MacDermid, Incorporated, Waterbury, Conn., the following companies have been appointed for rendering sales and service of the Anodex Process:

The Udylite Corporation
1651 East Grand Ave.,
Detroit, Mich.
A. T. Wagner Co.
2700 Wight Ave.,
Detroit, Mich.
Geo. A. Stutz Co.
1645 Carroll Ave.,
Chicago, Ill.
Munning & Munning, Inc.
202 Emmett St.,
Newark, N. J.
Donald Sales Co.
2546 West Greves St.,
Milwaukee, Wis.
La Salco, Incorporated
2822 LaSalle St.,
St. Louis, Mo.

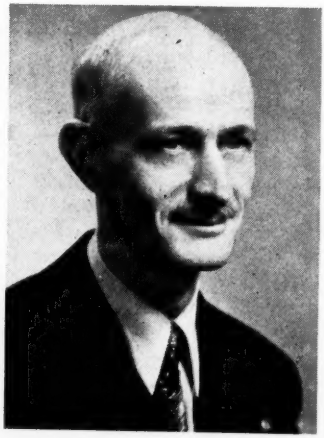
New Wrinkle Appoints Technical Research Director

New Wrinkle, Inc., Dayton, Ohio, recently announced the appointment of Mr. William A. Waldie as Technical Research Director of its recently organized Technical Research Department.

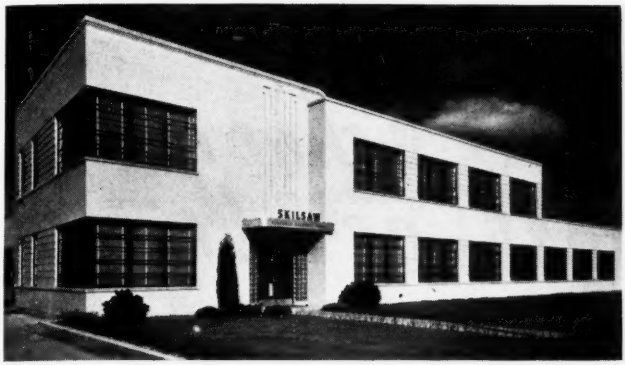
Mr. Waldie brings to his new position a wealth of practical experience. Graduating from Harvard in chemistry in 1908, he has been associated with the paint and varnish business continuously from that time.

His broad experience well adapts Mr. Waldie for his new position as technical director to render a genuine technical service to both licensees and users of wrinkle finishes—to develop new uses, process, and production methods and to co-operate closely on all laboratory problems affecting wrinkle finishes.

In addition to laboratory research, Mr. Waldie will be available to the licensees of New Wrinkle, Inc., to render a personal service. In this capacity, he will co-operate on formulas and



William A. Waldie



View of the new Skilsaw, Inc., daylight office and plant. The building was designed with a view to future expansion and is strikingly modern with blue steel sash and glass block trim.

•

their application, in the licensee manufacturer's laboratory, and in the user's product finishing department.

Skilsaw's Modern Plant Characterized by Compact Layout

The new factory and offices into which Skilsaw, Inc., 4743 Winnemac Ave., Chicago, Ill., recently moved represent an increase of two and one-half times the space previously occupied by this company. Departmentalization of production, storage and handling facilities in an efficient, logical layout has been applied to take maximum advantage of daylight. The plant was designed and built by The Austin Company, which introduced unusual modern features by the use of color and special treatment of brick and glass block in the exterior. The two-story office section extends across most of the 140-ft. landscaped facade, and the plant proper has an overall depth of 200 feet.

Four 30-ft. aisles and one 20-ft. which flanks an existing structure have been provided in the plant which has two monitors with 20-ft. clearance. Permanent rubber floor mats have been installed for the comfort of the men working at assembly benches as well as at the testing rack which is located in the assembly section.

In the new Skilsaw plant, where special provision has been made for research with a view for continuing development, the company makes nine sizes of portable electric saws, 18 models of electric drills, two types of portable bench sanders, three disc sanders, five portable blowers and industrial vacuum cleaners, plus hand grinders and a complete line of bench and pedestal grinders and buffers.

C. M. Hughes Joins Hilo Staff

Hilo Varnish Corporation, 42-60, Stewart Ave., Brooklyn, N. Y., takes pleasure in announcing that Mr. C. M. Hughes, formerly of Zapon, will be in charge of the Hilo lacquer department. His wide acquaintance and experience in the metal-finishing field qualify Mr. Hughes to render greater service for Hilo.

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EMERY
absolutely uniform

"INDIAN BRAND" TURKISH AND NAXOS EMERY

You get absolute uniformity . . . highest quality . . . greater capillarity and longer wear. Any size or quantity ready for immediate shipment. Write for trial lot.

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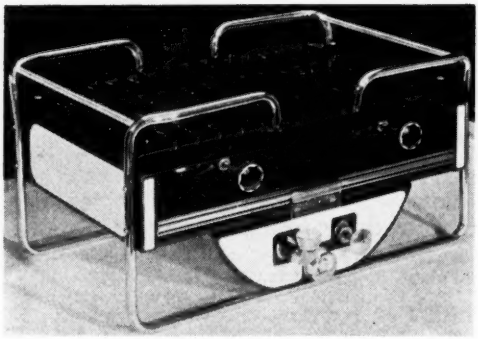
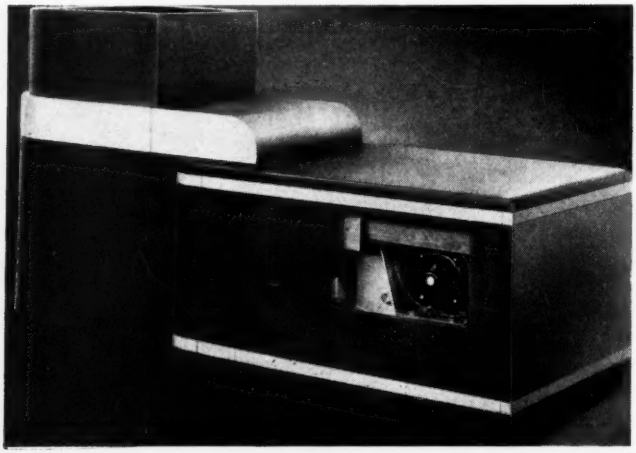


(Right)—Boat enthusiasts may now add a touch of smartness to the otherwise prosaic ship's galley with a marine stove such as shown herewith which is finished in rustproof pearl gray and black vitreous enamel with polished chromium plated trim.

(Photo Courtesy Designers for Industry)

(Photo Courtesy Harold Van Doren & Associates)



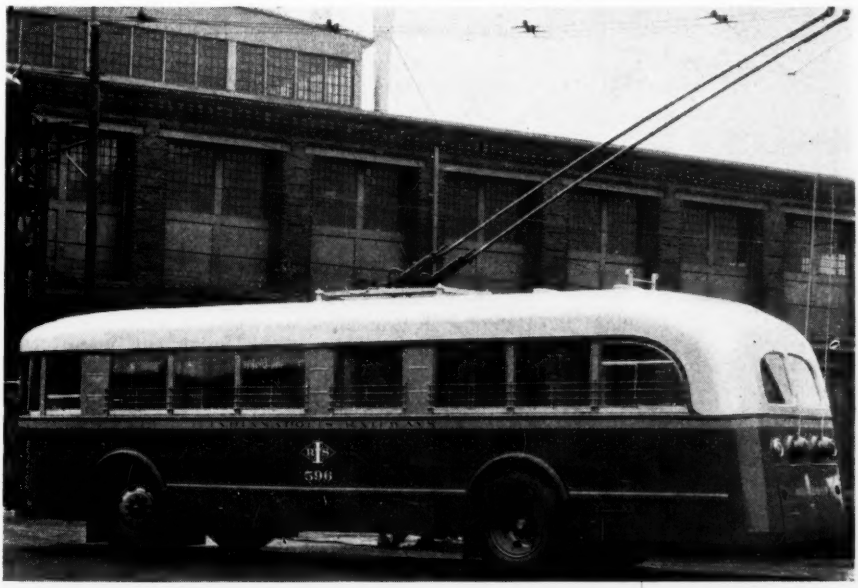
(Left)—This illustration shows a Waytrol electric vibrating feeder and weighing mechanism which is encased in an attractive streamlined metal sheath which is finished in gray, mar-proof enamel.

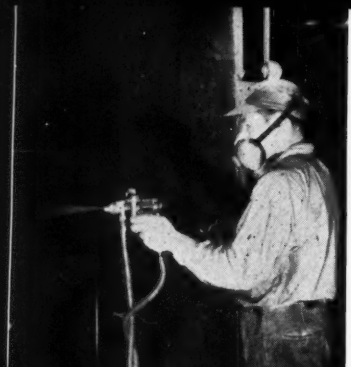
(Right)—These prize-winning packages are used by the Chrysler Corporation. Each has the same color motif in red and gray, with the exception of the largest, which has an all-over red top.

(Photo Courtesy Modern Packaging)

(Below)—Modernization of transportation facilities requires vehicles of the type shown here. The aluminum painted roof and brightly colored body add distinction to the trolley buses manufactured by The J. G. Brill Company.

(Photo Courtesy The J. G. Brill Company)





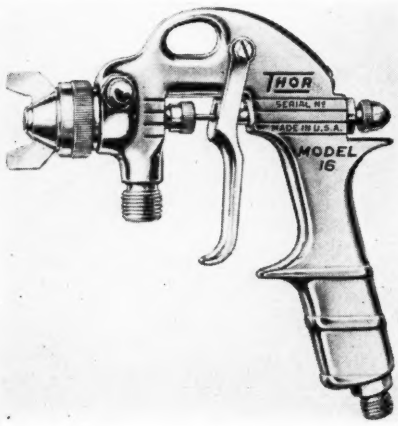
NEW Plant equipment and MATERIALS

Binks Thor No. 16 Light Duty Spray Gun

Binks Manufacturing Co., 3114-40 Carroll Ave., Chicago, Ill., has placed on the market a new streamlined spray gun for light work, which has been designated as the "Thor No. 16 Streamlined Light Duty Spray Gun."

In design, this gun is said to be an outstanding improvement, since it introduces modern streamlining in a spray gun. Other outstanding features of this type of gun are said to be maximum atomization and better control, interchangeable nozzles, less pressure drop, and less air consumption.

The control for the amount of material being sprayed is conveniently placed at the back of the gun while control of the width of spray can be made by means of a knurled screw which is located immediately behind a one-piece nozzle head.



Binks Thor No. 16 Light Duty Spray Gun

Hilo Vitra-Carlite Clear

Hilo Varnish Corporation, 42-60 Stewart Ave., Brooklyn, N. Y., has placed on the market a clear Vitra-Carlite finish. This type of metal finish can be applied by dipping and baking at 250 deg. F. for one hour to produce a beautiful finish with practically no discoloration of the metal.

The clear Vitra-Carlite is said to offer unusual possibilities for all kinds of dip work, enameled metal, and on bright metal parts which are subjected to considerable heat. Clear Vitra-Carlite can be used over colored enamels to give added lustre, toughness, and surface hardness.

Excelsior Improved Type Stainless Steel Polishing Machine

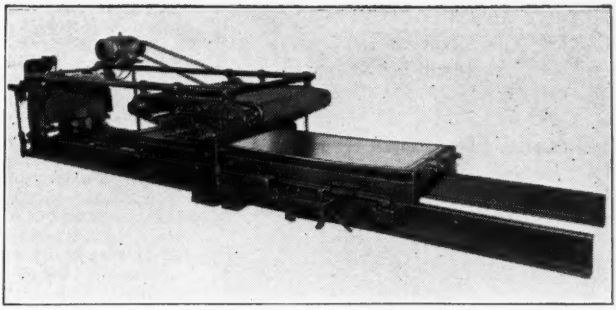
Excelsior Tool & Machine Co., Ridge Ave. and 30th St., E. St. Louis, Ill., has developed a stainless steel sheet polishing machine which can be installed by stainless steel equipment manufacturers to polish sheets to any required finish for a job in process. Stainless steel sheets can be polished by the Excelsior method to a No. 4 finish.

According to the manufacturer, four to 20 sheets of any gauge up to 4 ft. wide by 12 ft. long can be polished in one hour by two men. The grinding belts of the unit can be removed and

replaced within five minutes and are said to require no further adjustment after they have been centrally located on the drums.

All the adjustments of the Excelsior Improved Type Stainless Steel Polishing Machine are mechanically controlled and adjusted at one location. A positive clamping attachment for the sheets and the adjustable travel for the carriage are said to prevent any possible damage to the polishing belts or the rubber-covered contact pressure drum.

The pressure on the grinding belts, which varies from 200 to 600 lbs., is applied by a gravity pressure principle and is regulated by removable hand weights. This method is said to insure positive regulated pressure contact over the entire width and length of the sheets to be polished.

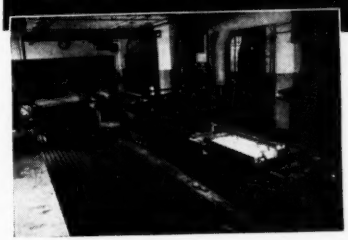


Excelsior Improved Type Stainless Steel Polishing Machine

The drums are diametrically balanced and revolve in oversize dustproof ball bearings that are mounted in rigid cast steel housings. There are no metallic connections between the polishing head and the carriage, thus vibration of the sheets to be polished is eliminated.

A 25 h.p. motor operates the polishing belts at 3,500 lineal feet per minute. A separate 2 h.p. geared motor is used to reciprocate the table at 60 feet per minute. Commercial paper grinding

Get Down to *Bare Metal*--FAST!



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have been scientifically developed to do fast, *economical* and dependable chemically clean work on each kind of metal surface on which plating is done. If you want speedier production, assured quality and fewer rejects—standardize on Magnus Cleaners.

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MAGNUS CLEANERS

belts up to 50 in. wide by 16 ft. are recommended. Commercial belts with No. 120 and 150 grain abrasive will polish a No. 2-B mill sheet to a No. 4 finish.

General Electric Strip Heaters

A new line of strip heaters for operation at sheath temperatures as high as 1,200 deg. F. has been announced by

General Electric Strip Heaters

General Electric Company, Schenectady, N. Y. The new G-E Strip Heaters are enclosed in a porcelain enamel steel casing and are said to have the advantage of resisting rust and corrosion.

The G-E Strip Heaters are said to be attractive in appearance.

In offering more resistance to rust and corrosion, it is expected that the porcelain enameled units will substantially reduce replacement costs in heavy duty application.

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USED ON IRON, STEEL, ALUMINUM, GALVANEAL AND GALVANIZED IRON SURFACES.

Use Metalprep to clean and prepare all sheet metal surfaces before painting. Removes rust and grease.

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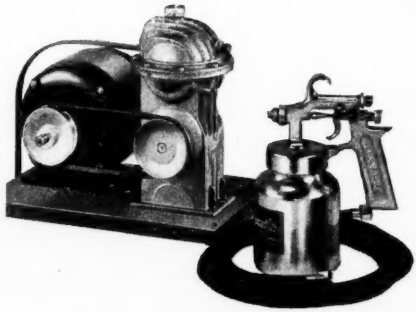
Sprayit Series 200 Paint Spraying Units

The Sprayit Series 200 Paint Spraying Units, now being marketed by The Electric Sprayit Company, 220 N. Broadway, Milwaukee, Wis., are said to represent the latest development in portable paint sprayers. These units, which are extremely compact and easily portable, combine high efficiency with low cost and are said to thereby meet the requirements of all classes of users of this type of equipment.

The Sprayit Series 200 Paint Spraying Units can be used for products finishing, general maintenance paint, refinishing, small production work in industrial plants, and so on.

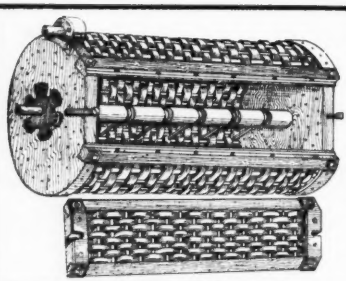
The compressor is mounted on a heavy sheet steel base, fitted with rubber bumpers, and is V-belt driven by a ¼ H.P. electric motor. The unit can



Sprayit Series 200 Paint Spraying Unit

be furnished without motor for operation either from a motor or line shaft. In installations of this type, belt and pulleys are furnished.

The compressor is of the diaphragm



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A wood woven cylinder adaptable to any barrel plating tank. The woven construction allows maximum agitation and produces a clean, smooth plate. Barrel should not rotate more than 2 r.p.m. Speed means wear, not plate. Made in two diameters: 12½" and 16". Lengths: up to 48". Write for illustrated folder.

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JOHN KING 48 SPRINGFIELD ST. DAYTON, OHIO

type which positively seals off the crankcase from the cylinder head, and thereby prevents any contamination of the compressor. The displacement of the compressor is 2.55 c.f.m. and the spraying pressure on the spray gun is 30 lbs. Operation is smooth and vibrationless, and the compressor air is completely free of pulsations.

The diaphragm compressor is made of Neoprene which is firmly backed by fabric in a cord construction and is practically indestructible. The spray gun is of the pressure feed internal break-up type, and is fully adjustable. The gun body and removable cover are made of die cast aluminum. The container is of one quart capacity, and is also made of aluminum.

Three internal mix spray nozzles for round, fan, and angle sprays are furnished with the gun. All nozzles and the fluids tips are made of case-hardened steel to prevent wear.

The spray gun of the Series 200 Paint Spray Units will deliver a spray up to eight inches wide, which permits a coverage up to 1,200 sq. ft. per hour. The complete unit includes the compressor, the spray gun, and 15 ft. of high grade air hose.

Vonnegut Brush-Backed Sanding Head

A brush-backed sanding head has been placed on the market by Vonnegut

Vonnegut Brush Backed Spindle Sander showing end view with cover removed.

New, Safer Way to Discharge Carboys, Drums and Barrels!

T.P.C. SAFETY SIPHON

• This efficient, inexpensive device provides smooth, controlled flow of acids and chemicals, without danger of splashing or spilling. It produces a regulated flow from a trickle to 6 gallons per minute. Reduces hazards of burns and fumes. No manual tilting of carboys. Works on vacuum principle, eliminating the pressure method condemned by the M. C. A. Sturdily built. A type for every acid. Put a T. P. C. Safety Siphon on test. State type of acid or chemical, and container, when ordering. Detailed literature and prices on request.

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ALSO . . . Carboy Truck and Tilter, Respirators, Goggles, Aprons, Gloves, Hoods, Skin Protective Creams, Pails and Dippers. Write for leaflet "Safe Handling of Acids and Chemicals."

Moulder Corp., 1807 Madison Ave., Indianapolis, Ind. This sanding head includes eight strands of shredded abrasive cloth held on a central drum for outward feed between individual units in a ring of brushes mounted on a head rim. Eight stabilizer brushes mounted on the rear or closed end of the head by means of spring-tensioned hinges can be turned up and out of the way when the head is being loaded with a fresh supply of paper.

The stabilizer brushes press the abrasive strips against the sides of the main brushes to restrain the shredded abrasive ends from spreading around the sides of narrow work and to prevent the abrasive from fluttering while the head is in motion.

The brush-backed abrasive permits application of the head in sanding irregular shaped forms and surfaces, since the shredded ends arrange themselves to conform with the contour of the work when it is pressed into contact with the flexible brush bristles while the head is revolving.

In the internal construction, pins project from the ends of an inner sleeve to engage with recesses in the cover cap so the abrasive strips can be wound upon an inner sleeve by rotating the cap while holding the outer shell in a fixed position. The winding operation can be conducted until the extended end

View of Vonnegut Brush Backed Sander with cover in place.

of the eight strips, each from 18 to 30 in. in length, have been pulled almost to the ends of the projecting brushes. The cap can then be locked into position and the head put to work until the slightly projecting abrasive has become worn. At this point, the cap can be loosened and another small amount of abrasive fed outward to operating position. The machine on which this type of head can be mounted for best results is a double end assembly driven by a 2 h.p. motor operating at approximately 1,200 r.p.m.

This Sanding Head has proven its value in the woodworking industry—especially for sanding irregular shapes

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An etched grain built to withstand the shock and stress of rough work. Sizes 10-90 incl.

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An etched grain designed to prevent glazing. For operation where little self-dressing of the wheel occurs. Sizes 24-90 incl.

3. ST LIONITE
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Cleans, etches, and prepares metal for a perfect finishing job.
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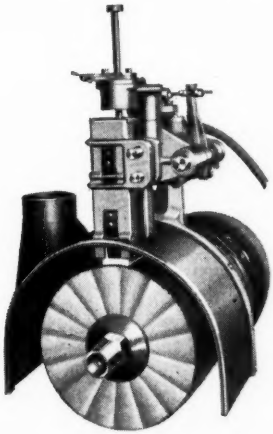
and forms, such as carvings, shaper and moulder work—but it is also being recommended for roughing operations leading to the finishing of irregularly shaped forms in other materials, including metal castings and stampings.

Hammond Auto-Doper

A device for applying buffing composition to the buffing wheel automatically, to be known as the "Auto-Doper," has been placed on the market by Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Mich. The Auto-Doper can be used on buffing lathes, semi-automatic and automatic buffing machines.

The main castings of the Auto-Doper are made of aluminum and the head



Hammond Auto-Doper

oscillates so that the bar of composition is applied to the wheel momentarily. As the composition is applied and removed from the wheel, the force of air generated by the revolving wheel is said to keep the composition cool.

The Auto-Doper is operated by compressed air through a three-way valve which can be timed to the conveyor of the buffing machine. On machines without a conveyor unit, particularly semi-automatics and polishing lathes, the timing of the application can be arranged by an electric timing device or by a foot-operated valve. In the latter case, the operator merely steps on the

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No matter what your spraying problems may be, you'll find this complete, 30 page Spraco catalog unusually handy. For Spraco finishing equipment covers the full range of today's requirements for uniform, high speed finishes—includes guns for all types of materials, pressure and gravity feed containers, spray booths, fans, rinsing nozzles, and accessories.

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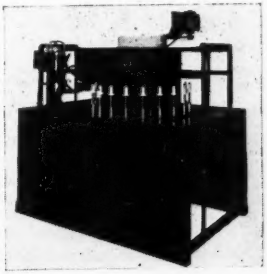
So whether you need a single gun, or a complete finishing system, check with Spraco. And write for catalog today. No obligation, of course.



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FOR 30 YEARS SPECIALISTS IN SPRAYING EQUIPMENT

foot treadle when composition is to be applied to the wheel.

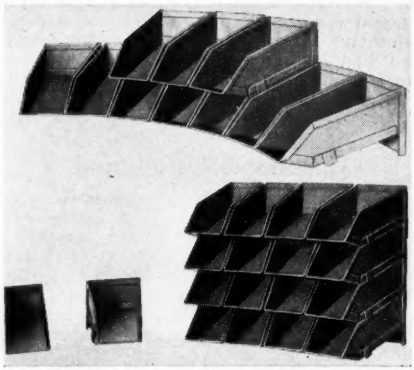
The standard size Auto-Doper as shown is equipped to handle bars of composition from 2 in. square up to 2 in. x 6 in. A similar model is also available that will accommodate 2 in. diameter bars which rotate after each application, thus preventing a narrow buffing wheel from cutting a groove in the bar and causing waste.

The Auto-Doper is not limited in its use to Hammond polishing lathes and automatic equipment. It can be used on ordinary lathes and automatic equipment of practically any make.

Stackbin Assembly Bin

To fill a need for a uniform stacking assembly bin which can be used on any assembly bench, Stackbin Corporation, 92 Troy St., Providence, R. I., has designed a new bin which feeds contents toward the front. This type of bin can be set up in a semi-circle and can be stacked one above the other to keep all parts within efficient reaching distance.

The Stackbin Assembly Bin units are 8 in. long, 2½ in. deep, 4 in. wide in back and 3 in. wide in front. Heavy gauge sheet steel and welded construction are said to assure durability and long life.



Stackbin Assembly Bin

Stow Angle Head

An improved angle head which was designed especially for heavy duty operations with cup-shaped grinding wheels, brushes, sanding, and polishing sets was recently placed on the market by Stow Manufacturing Company, Binghamton, N. Y. The spindles of the unit are mounted in oversize grease sealed ball bearings and the ball bearings are mounted in steel inserts.

The Stow Angle Head is sealed against dirt and is furnished for either wet or dry grinding operations. The housing of each head is made of aluminum.

The cover with the valve mechanism is made of brass, thus insuring a smooth working valve at all times. The diam-

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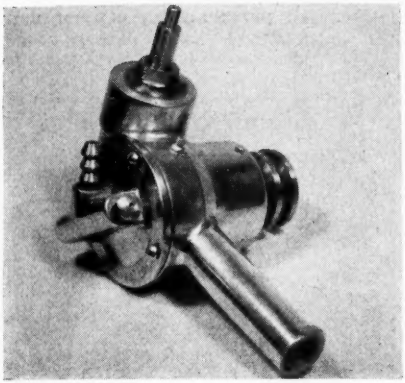

Stow Angle Head

eter is 3½ in., and the height overall is 6⅛ in. The Stow Angle Head is constructed to run at speed ratios of from 1 to 1 to 20 to 1 reductions. This improved type angle head will fit Stow Flexible Shafts Numbers 2A, 3A, 4A, and 5A.

Impervium

An insulation for plating and chemical equipment, to be known as "Impervium," has been placed on the market by Paramount Rubber Service, Inc., 1430 Rosedale Court, Detroit, Mich. This insulation is said to be immune to all plating solutions, possesses extraordinary dielectric resistance, and is unharmed by oil.

Impervium is said to be a combination of synthetic resins that will retain a rubbery flexibility and elasticity over a long period of time. This type of insulation can be used on tanks and pipe linings for chemicals and for protection against practically every corrosive agent.

Taylor Hygrometer

Taylor Instrument Companies, West Ave. and Ames St., Rochester, N. Y., have placed on the market a wet and dry bulb hygrometer that combines high accuracy and legibility with complete accessibility for installation and routine servicing. To increase the efficiency of the Taylor Hygrometer, the wet and dry bulbs have been staggered, and consequently can be used in either horizontal or vertical ducts without being on the same plane. This is said to assure proper circulation of air across both bulbs under all conditions.

A new type skeleton guard around the bulbs prevents breakage and is designed so as to have no heat capacity effect to alter the heat or to hinder the free circulation of air.

The flat tube scales of the Taylor Hygrometer are mounted horizontally. This presents a more natural position for reading the mercury column and is said to greatly increase the angle of

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Resists salt spray remarkably.
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vision, assuring greater ease of reading. A new flat, smooth glass thermometer tube provides ample space for the bold display of numerals and gradutions which are etched on the back of the thermometer stem.

There are no separate scales to slip, corrode or tarnish. The accuracy and dependability of an etched stem thermometer is combined with the durability of a rugged industrial thermometer. To give ease of reading, the etched numerals are filled with black pigment and covered with an orange-yellow lacquer for maximum legibility and contrast. The flat, smooth front surface of the thermometer tubes makes them especially easy to clean.

Rubber grommets insulate the thermometer stems and bulbs from all metal parts, eliminating bulb conduction error and reducing the chance of breakage from mechanical shock. The required opening in the duct for installation is only 8 in. x 2¾ in. No extra hand hole is required for installation or servicing.

The operation of the Taylor Hygrometer is said to be very simple. Water is supplied to the wick by filling the water bottle and inverting it in the bottle holder. All parts having contact with

Taylor Hygrometer

the water are treated for corrosion resistance.

Where a pressure or vacuum of more than ½ in. of water makes a bottle-fed hygrometer impractical, the Taylor Instrument Companies have designed the Taylor Hygrometer with constant level reservoir. This tap-fed reservoir is adapted for use on any hygrometer and is said to be very easy to mount and to clean and is composed entirely of corrosion resistant materials. The space required for installation is 4 in. x 8 in. The height of water in both the float and wick chambers is adjustable.

Armstrong Snap-Action Air Trap

An automatic mechanical tray for draining water from compressed air

DIE CASTINGS UNETCHED BY 30 MIN. BATH

A LARGE COMPANY cleaning zinc-base castings for nickel plating had considerable etching. By switching to Metso Cleaner, articles are now suspended as long as 30 minutes without visible etching, even though cathode cleaning for this period. Die castings are now clean and unetched. For any cleaning prior to plating, get improved results with Metso.

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(INFRA-RED RAY)

CARBON LAMPS

Cut drying costs . . . Save time . . . Use minimum space . . . Get uniform results

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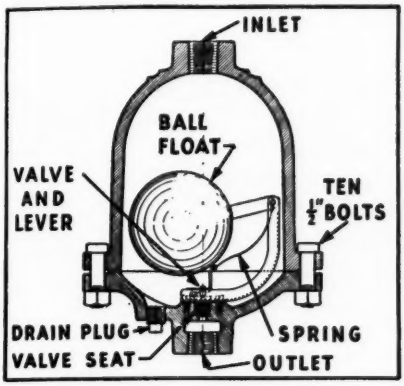
NORTH AMERICAN ELEC. LAMP CO.
1020 TYLER STREET ST. LOUIS, MO.

lines, tanks, separators, and aftercoolers, to be known as the "Snap-Action," has been placed on the market by Armstrong Machine Works, 831 Maple St., Three Rivers, Mich. According to the manufacturer, the principal advantages



Cross-section diagram of "Snap-Action" Air Trap

claimed for the device are immunity to ordinary dirt troubles, a means of discharging water without any loss of air, positive opening and closing of discharge valve, and freedom from need of priming.

As shown in the cross-section diagram, the trap has a ball float which is connected to a short valve lever through a flat strip of stainless spring steel. In the closed position, the spring is bowed downward. As water enters the body of the trap, the ball float rises, bending and storing up energy in the spring.

Before the ball float reaches the top of the trap, the spring bends past dead-center and the stored-up energy snaps the valve wide open. In this position the spring is bowed upward.

As the water level drops in the trap body, the cycle is reversed and the valve snaps shut. There is a quick, forceful closing that prevents pieces of dirt from getting clogged in the valve and causing leakage.

The capacity of the unit is 1,400 lbs. of water per hour at 125 lbs. pressure or 1,000 lbs. per hour at 250 lbs. pressure.

Hilo Rip-pl Finishes

The five Hilo "Rip-pls" which were placed on the market by Hilo Varnish Corporation, 42-60 Stewart Ave., Brooklyn, N. Y., are especially suited for use on cabinets, auto accessories, household appliances, cash registers, novelties, typewriters, and so on. These finishes are said to bake hard and provide a tough coating.

The patterns provided by the five Hilo

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The ideal set-up for your Finishing Department. Lupomatic's completely automatic, inexpensive simple method of finishing metal parts of every description will enable you to:

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Increase Production
Varied shapes and sizes more uniformly Finished
SEND SAMPLE TIME STUDY GLADLY GIVEN.

Packer-Matic Automatic Polishing & Buffing Machines

Cut Hour Costs
Automatically — todays Method of Finishing
THE PACKER MACHINE CO. MERIDEN, CONN.

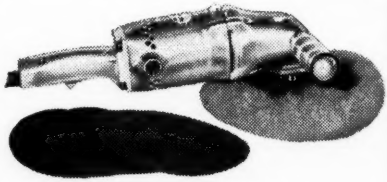
Rip-pls vary from fine, uniform to coarse, heavy structure without glossy spots or "fish eyes." These finishes are available in all the colors of the rainbow. Standard colors include dark shades, clear, brilliant reds, blues, and greens, and soft pastels.

Hilo Rip-pl finishes are easily applied. Workpieces can be finished by means of a few strokes of the spray gun and then placed in an oven.

Van Dorn Sander-Buffer

The Van Dorn Electric Tool Co., Towson, Md., has announced a new Combination Sander-Buffer which is said to be considerably lighter, shorter, and better balanced than previous models. Many new mechanical features have been incorporated, such as a dustproof rocker type switch and reversible side handle for either right or left hand operation.

The Van Dorn Sander-Buffer is said to be particularly adapted for handling a variety of sanding, buffing, and cleaning jobs in shops where intermittent service is required. The unit is equipped with two sets of double gears and a transmission gear which is easily shifted from one to the other to provide either low or high spindle speed. A patented gear locking pin in the gear housing locks the gears for the changing of pads and discs.



Van Dorn Sander-Buffer

A high spindle speed of 3,700 r.p.m. is correct for seven-inch sanding operations, and the low speed of 1,400 r.p.m. is said to be correct for buffing. The change in the gear ratio for the low spindle speed also increases the torque, which is valuable in rubbing down lacquer and paint.

Thermo-Electric Thermostatic Control

According to a recent announcement, a problem involving unusually close heat control limits was recently solved by an electrically-operated thermostatic control made by Thermo-Electric Company, 1012 W. Superior Ave., Cleveland, Ohio, for a well-known finishing material manufacturer. Specifications call for a hot-plate for testing the polymerization or solidification points of varnishes and their bases previous to the cooking process. The maximum temperature variation permissible from the hand set-

"MAGIC" TACK RAGS
IMPROVE YOUR FINISH 100%

MAGIC TACK RAGS remove specks, lint and sand particles--- bring out that deep, smooth luster, produce a faultless surface for white or colored finish. Why use "home made" tack rags when you can buy MAGIC TACK RAGS at trifling cost! They are tackier, do not dry--- are dust-proof and spontaneous combustion proof. Packed in dozen and gross lots or more. Made only by the

Wm. A. Juergens Co.
4036-40 Lagrange Street,
Toledo, Ohio, U. S. A.
If your dealer does not carry Magic Tack Rags, write us for sample.

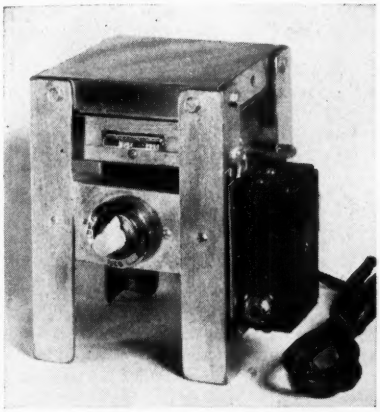
Borolon TRADE MARK **ABRASIVE POLISHING GRAIN**

Strictly first quality aluminum oxide abrasive grain manufactured in our own electric furnace plant. Specially prepared and treated for most efficient polishing performance. Write for samples.

ABRASIVE COMPANY GRINDING WHEEL AND ABRASIVE DIVISION OF SIMONDS SAW AND STEEL CO. **PHILADELPHIA, PA.**

ting on the adjusting switch is plus or minus one degree Fahrenheit.

In testing varnish, a drop of the material is placed on the surface of the plate and rubbed until it solidifies and the time is carefully noted on a stopwatch. The control system employed is adaptable to many types of industrial uses where liquids must be maintained at constant heat between 400 deg. F. and minus 30 deg. F. Several convenient heat ranges are available. A handset regulating switch which is provided is capable of adjustment down to 75 per cent of each particular range maximum.



Varnish testing hot-plate with new automatic thermostatic electrical control which permits less than one degree F. variation from an adjusted setting.

Chromium Rustproofing Material

A rustproofing material to be known as "Chromone" for coating the interior surfaces of water systems has been placed on the market by Corrosion Engineering Co., 4600 Fernhill Rd., Philadelphia, Pa. Chromone reacts with the metal surfaces of water storage or recirculating systems to form a thin protective film. It is a liquid material to be used for addition to the water in the proportion of two fluid ounces to each five gallons of water.

Chromone does not evaporate and does not impart any color to the material to which it is added. This material can be used for water cooling systems and also to prevent corrosion and formation of scale or slime on interior water contacting surfaces.

Ferrotect Coating Material for Protection Against Corrosion

Three protective coating materials to be marketed under the trade names of "Aquasan," "Chemisan," and "Hytempsan" for coating metals for protection against corrosion have been developed

PAINT NOW STAYS PUT ON METALS

DEOXIDINE prepares metal surfaces perfectly for painting.

ELECTRO, SPRAY and THERMOIL GRANODINES protect against rust and preserve paint.

LITHOFORM keeps paint intact and lustrous on zinc and cadmium surfaces.

Write for bulletins.

AMERICAN CHEMICAL PAINT CO.
BOX 303 AMBLER, PENNA.

Oriental Rouge is the ideal rouge for obtaining a mirror-like finish on stainless steel, silver, gold and all other metals. Write for details.

Oriental Rouge Co., Inc.
Established 1901
66 Pine St. • Bridgeport, Conn.

by Ferrotect Industries, 727 Varsity Rd., South Orange, New Jersey.

Aquasan is designed to protect ferrous metals against corrosion when exposed to the atmosphere or other deteriorating agents such as water vapor.

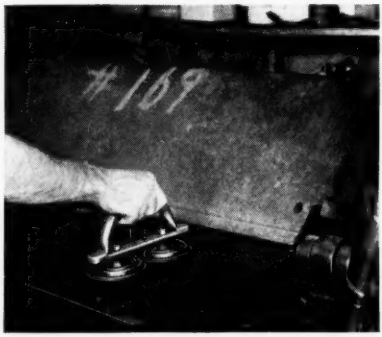
Chemisan is compounded in such a manner that it is said to protect ferrous metals against corrosion which is due to acid-saturated steam and corrosive vapors.

Hytempsan is designed for use on smoke stacks, boiler fronts, flues, uptakes, and exhaust lines in protecting against corrosion at temperatures up to 900 degrees Fahrenheit.

Bastian Blessing Suction Cups for Handling Flat Metal Ware

The illustration herewith shows a view of the application of the suction cups and handles that have been placed on the market by Bastian Blessing Company, 258 E. Ontario St., Chicago, Ill., for handling flat sheet metal ware.

The Bastian suction cup tools are available in designs for light, medium and heavy work. The assembly includes two replaceable cups, a handle on which they are assembled and also a means



Bastian Blessing Suction Cups for Handling Flat Metal Ware

to relieve vacuum when disengagement with the work is desired. The Bastian suction cup tool can be used for handling all types of sheet materials and products which have a smooth, nonporous surface.

Wheelco Potentiometer Controller Series 3200

The Wheelco Potentiometer Controller Series 3200, which was recently placed on the market by Wheelco Instruments

Wheelco Potentiometer Controller Series 3200

Co., 1931 S. Halsted St., Chicago, Ill., is said to match the unexcelled sensitivity of the Capacitrol control system

Check In AT DE WITT OPERATED HOTELS
In Cleveland
HOTEL HOLLENDEN
In Columbus
THE NEIL HOUSE
In Akron
THE MAYFLOWER
In Jamestown, N. Y.
THE SAMUELS
and
THE JAMESTOWN
In Corning, N. Y.
BARON STEUBEN HOTEL
DeWITT OPERATED HOTELS
Theo. DeWitt, Pres. R. F. Marsh, Vice Pres.

with the accuracy of the potentiometric method of temperature measurement. The Series 3200 Controllers are adapted to actuate any customary type of fuel valve or electric contactor.

The Wheelco Potentiometer Controller Series 3200 has instantaneous control action. There is no time lag between temperature deviation and control.

The "Radio Principle" of the Wheelco Capacitrol renders a high degree of performance. A mere 0.002 in. movement of the temperature controller galvanometer pointer produces instant and positive control.

The Wheelco Potentiometer Controller is all electric in design and strictly non-mechanical, devoid of all contacts, depressor bar mechanisms, cams, and mechanical moving parts.

Mechanic's Hand Soap

A liquid mechanic's hand soap, to be marketed under the trade name of "Grimax," has been placed on the market by C. B. Dolge Co., Westport, Conn. The soap is available in a liquid form and is said to contain ingredients which enable it to remove heavy grime from the hands without attacking the skin texture.

Grimax liquid hand soap can be dispensed through equipment which is supplied by the manufacturer. Grimax is available in 1 gallon to 55 gallon containers.

Mention PRODUCTS FINISHING when writing to advertisers. Your co-operation will be appreciated both by the advertiser and this magazine.

Opportunity Section

THIS Opportunity Section is available for classified advertisements featuring equipment, employment, business opportunities, etc., in the industries devoted to the cleaning, plating, polishing and finishing of metals. For advertising rates and other information address:
PRODUCTS FINISHING
431 Main Street • Cincinnati, Ohio

PRODUCTION SPECIALISTS IN
Lacquering - Enameling - Wrinkling
Tumbling - Graining
Make our plant your factory for economical, modern metal finishing.
H. S. Products Finishing Corp.
1768 DEAN STREET BROOKLYN, N. Y.

Lacquer salesman experienced with following in Metropolitan New York, wanted by long established Eastern manufacturer. Our men know of this advertisement. Address Box 17, Products Finishing, 431 Main Street, Cincinnati, Ohio.

SALES AGENTS WANTED

Agents wanted by Arms Corporation to sell efficient, rustproof black finish for iron and steel products. Also an oil to preserve underwater machinery. Send qualifications, territory and references to PRODUCTS FINISHING, 342 Madison Avenue, New York, N. Y.

FOR SALE
Guaranteed DeVilbiss Reconditioned Guns
Booths—Fans—Transformers
DeVilbiss Distributors
Hovey Spray Equipment Co.
1509 Spring Garden St. Philadelphia, Pa.

for your CATALOG *library*

To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Woven Wood Plating Barrel

Folder describes many features of the King woven wood plating barrel. John King, 48 Springfield St., Dayton, Ohio.

2. Industrial Ovens

Two new bulletins giving full particulars on air heaters and industrial ovens. J. O. Ross Engineering Corporation, 350 Madison Ave., New York, N. Y.

3. Airway Ventilated Buffs

Cool cutting buffs for high speed buffing operations are illustrated and described in a 4-page folder now being distributed by Jackson Buff Corporation, 21-03 41st Ave., Long Island City, New York.

4. Spray Painting and Finishing Equipment

A most complete catalog describing and illustrating spray painting and finishing equipment manufactured by Binks Manufacturing Company, 3114-40 Carroll Ave., Chicago, Illinois.

5. Aluminum Oxide Abrasive Grain

A 4-page catalog describing "Borolon," an aluminum oxide abrasive grain for the polishing trade and general industrial use. Abrasive Company, Tacony and Fraley Sts., Phiadelphia, Pa.

6. Flexible Shaft Driven Power Tools

Catalog describing the complete line of Biax and Jarvis Flexible Shaft machines, together with accessory equipment and tools. The Charles L. Jarvis Company, Middletown, Conn.

7. Metal Preparation Before Finishing

A folder describing the practical use of Rusticide "50" in preparing metal surfaces before paint. Rusticide Products Co., 3125 Perkins Ave., Cleveland, Ohio.

8. Hovey Spray Equipment

A 4-page catalog describing and illustrating Hovey Spray painting guns and painting outfits is now being issued by Hovey Spray Equipment Co., 1509 Spring Garden St., Philadelphia, Pa.

9. Continuous Feed Sand Blast Equipment

This catalog tells how a uniform surface finish can be obtained by the sand blast method. Leiman Bros., Inc., 4W-23 Walker St., New York City.

10. Hartford Triple-Action Cutting Barrels

Information regarding the methods and equipment for "cutting down" in much less time and at much less expense are described in this catalog now being issued by The Hartford Steel Ball Co., P. O. Box 146, Station A, Hartford, Connecticut.

11. Corrosion-Proof Laboratory Equipment

The bulletin designated as No. 503 in which acid-proof chemical stoneware is illustrated and described is being issued by The U. S. Stoneware Co., Akron, O.

12. Paradata

"Paradata" is the bulletin describing Impervium, an insulating material for plating and chemical equipment. Paramount Rubber Service, Inc., 1430 Rosedale Court, Detroit, Mich.

13. Economical Degreasing

A series of leaflets covering practically every phase of metal degreasing are now being published by Detroit Rex Products Co., 13017 Hillview Ave., Detroit, Mich.

14. Speed-Bloc Sanders

Literature describing the labor and abrasive savings made possible with the use of these machines is now being issued by Sterling Products Company, 2457 Woodward Ave., Detroit, Mich.

15. Speedip Whirl Enameler

A 4-page bulletin describing a combination dipping-whirling machine for completely coating large quantities of parts with lacquer, enamel, paint or any other liquid finishing material. Ronci Machine Co., 45 River Ave., Providence, R. I.

16. Falstrom Industrial Ovens and Dryers

A 4-page catalog illustrating and describing such features as performance, economy, and ruggedness of Falstrom Engineered Ovens, Falstrom Co., Main Ave., Passaic, New Jersey.

17. Enamelers' Reference No. 3

The refining of enamelers' clay by Dr. G. H. Spencer-Strong is the subject of this 12-page catalog now being issued by The Porcelain Enamel & Mfg. Company, Eastern and Pemco Aves., Baltimore, Maryland.

18. Automatic Composition Applicator

Circular describing the new Hammond "Auto-Doper" which applies composition automatically to buffing wheels is now available. Hammond Machinery Builders, Inc., 1622 Douglas Ave., Kalamazoo, Michigan.

19. Control Your Electroplating Process

A method of determining pH by means of Taylor slide comparators is explained in simple terms in a catalog now being issued by W. A. Taylor & Company, Inc., 872 Linden Ave., Baltimore, Md.

20. Protective and Decorative Finishes

Hilo Varnish Corporation, 42-60 Stewart Ave., Brooklyn, N. Y., presents Bulletin No. 15 titled, "The Five Hilo Rip-pls."

21. Bonderizing

The Parker Process that holds paint to steel and resists rust, known as "Bonderizing," is described in this catalog now being issued by Parker Rust-Proof Company, 2172 E. Milwaukee Ave., Detroit, Michigan.

22. Improved Air Cleaning for Industry

A beautifully illustrated catalog describing the Centri-Merge Method of cleaning air is now being issued by Schmieg Sheet Metal Works, 314 Piquette Ave.,

23. Sargent Electrometric Titration Assembly

A folder describing the new applications that are now possible for the electrometric titration method being marketed by E H. Sargent & Co., 155 E. Superior St., Chicago, Illinois.

Print plainly in filling out coupon for literature.

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431 Main St., Cincinnati, Ohio

I am interested in receiving the following literature reviewed in your June issue.

No...... **No.**..... **No.**..... **No.**..... **No.**.....
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Company• Address .....

City ..... State.....

INDEX *to advertisements*

Abbott Ball Company, The....45
Abrasive Company....66
Abrasive Products, Inc....19
Advance Paint Co....33
American Air Filter Co., Inc....23
American Chemical Paint Co....67

Cooper & Co., Inc. of N. J., Charles....62

Detroit Rex Products Co....Fourth Cover
DeWitt Hotels, Inc....68

Egyptian Lacquer Mfg. Co....6

General Abrasive Company, Inc....60

Hamilton Emery & Corundum Co....53
Harshaw Chemical Co., The....47
Hovey Spray Equipment Co....69

Jackson Buff Corporation....36, 37
Juergens Co., Wm. A....66

Keystone Emery Mills....63
Kidde & Company, Inc., Walter....8
King, John....58
Kirk & Blum Mfg. Co., The....5

Lupomatic Tumbling Machine Co....65

MacDermid, Inc....4
MacFarland Mfg. Co., Inc....38, 39
Magnus Chemical Company....57
Mahon Company, The R. C....25
Mechanical Process Corporation....62
Miller Rubber Company....43

Neilson Chemical Co....58
North American Electric Lamp Co....64
Norton Company....41

Oakite Products, Inc....1
Oriental Rouge Co., Inc....67

Packer Machine Co., The....65
Parker Rust Proof Company....31
Pennsylvania Salt Manufacturing Co....29
Philadelphia Quartz Company....64
Products Finishing Corp., H. S....69
Pulmosan Safety Equipment Corp....59

Roxalin Flexible Lacquer Co., Inc....Second Cover
Ross Engineering Corp., J. O....Third Cover
Rusticide Products Co....60

Spraco, Inc....61
Stanley Chemical Co., The....15
Sterling Products Company....51

Udylite Corporation, The....21

Varnish Products Co., The....63

Warren Webster & Company....3
Watson-Standard Co., The....2

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